MATERIALS TOWARD A MONOGRAPH OF THE GENUS VERBENA. XXVI

Harold N. Moldenke

VERBENA STRICTA Vent.

Additional bibliography: Parks & King, El Crisol [Puerto Rico] 4: 74--80. 1950; Chem. Abstr. 45: 3037. 1951; M. L. Buch, U. S. Dept. Agr. Handb. 64: 13. 1960.

Parks & King (1950) and Buch (1960) report the occurrence of ursolic acid throughout this plant.

Additional citations: KENTUCKY: Ballard Co.: Anderson & Mc Farland 253 (Ky); McFarland & Anderson 253 (Vi), s.n. [Wickliffe, Aug. 16, 1923] (S). Campbell Co.: Van Cleve s.n. [Dayton] (Ky). Edmonson Co.: Lix 454 (W--1948092). Fulton Co.: Biltmore Herb. 3653a (N). Hickman Co.: H. A. Gleason 8978 (N). Kenton Co.: E. L. Braun s.n. [Devon Park] (Cn). Marshall Co.: Eggleston 4837 (N). TENNESSEE: Chester Co.: S. M. Bain 328 (C). Obion Co.: Jennings & Jennings s.n. [Reelfoot Lake, 1924] (Cm). Smith Co.: Gattinger s.n. [Hickman] (W--147589). MICHIGAN: Alpena Co.: Cain, Raymond, & Kucyniak 583 (Go, Mg, S, Vi). Charlevoix Co.: J. H. Ehlers 642 (Mi, Po--63839). Cheboygan Co.: J. H. Ehlers 5165 (Mi), 5613 (Ca--882816, Mi); E. G. Voss 1038 (Mi), 1315 (Mi). Clinton Co.: Scholes & Rafferty RL.97 (Mi). Emmet Co.: J. H. Ehlers 2453 (Mi), 3489 (Hi--143745, Mi), 4856 (Ca--498895, I), s.n. [W. of Pellston, July 1923] (Ka--68122); F. C. Gates 14450 (Ka--70014). Grand Traverse Co.: Dieterle 1850 (Mi, S). Gratiot Co.: C. A. Davis s.n. [Elwell, Sept. 1900] (Mi, Mi). Kalkaska Co.: H. N. Moldenke 21944 (Lw). Kent Co.: Bazuin 2232 (Mi); Mullikan s.n. [July 19, 1897] (Mi); Parmelee 826 (Au--191548). Livingston Co.: F. J. Hermann 9159 (Mi, N). Menominee Co.: Grassl 2750 (Mi, N). Missaukee Co.: E. G. Voss 3065 (Mi). Montcalm Co.: A. R. Moldenke 1033 (Lw). Oakland Co.: Farwell 6359 (Mi). Saint Joseph Co.: G. L. Fisher s.n. [July 2, 1923] (S). Washtenaw Co.: Dodder s.n. [July 1931] (Ok--10365); Frickelton s.n. [July 13, 1931] (Ok--10366). Wayne Co.: F. C. Schmid s.n. [Romulus, August 1, 1943] (Mi). WISCONSIN: Adams Co.: R. T. Brown 117 (Ws); J. W. Thomson s.n. [Aug. 15, 1937] (Ws). Brown Co.: Shinners 3798 (Ws). Buffalo Co.: H. H. Smith 7113 (B, Ws). Columbia Co.: Alberts s.n. [Sept. 29, '45] (Ws); Rob. Burton 124 (Ws); H. P. Chandler 349 (Ca--25189); Fernholz s.n. [Aug. 18, 1930] (Ws); H. K. Henry 109 (Up); Lemke 84 (Ws); Orpunt s.n. [7/5/49] (Ur); H. L. Russell s.n. [Sept. 4, '85] (Ws); F. J. W. Schmidt s.n. [Oct. 1, 1934] (Ws); F. C. Seymour 10280 (Ws); H. H. Smith 8034 (B, Ws); J. Wright s.n. [September

29, 1945] (Ws, Ws). Crawford Co.: Fassett 9788 (Um--205, Ws); H. W. Graham s.n. [July 9, 1928] (Cm); D. Marsh s.n. [September 21, 1959] (Ws); A. R. Moldenke 993 (Lw); Pammel & Pammel s.n. [Prairie du Chien, Aug. 8, 1929] (Io--133834); H. H. Smith 7454 (B, Ws); R. Sprague s.n. [7/4/26] (Cn, Cn); Ugent s.n. [July 25, 1960] (Ws). Dane Co.: C. C. Albers 33014 (Au), 34007 (Au); Bakken 122 (Ws); Botany 162 Class s.n. [Sept. 28, 1935] (Ws); L. S. Cheney s.n. [July 23, 1888] (Ws); H. M. Clarke s.n. [Sept. 4, 1957] (Ws, Ws); Greeley s.n. [Madison, July 3, 1949] (Ca--903546); Grether 8189 (Ws); Heddle 2421 (Ws), 2678 (Ws), 2728 (Io--109880); Koeppen 117 (Ws), 120 (Ws); Lapham s.n. [1858] (Ws); McCabe s.n. [27 July 1945] (Ws), s.n. [13 August 1945] (Ws); A. R. Moldenke 1012 (Lw); Monroe s.n. [October 10, 1959] (Ws); Reinert s.n. [10/8/59] (Ws); Schlising & Musolf 60-111 (Ws); A. B. Seymour 1063 (H--107722, Ur, Ws); Shinners 2439 (Ca--882819); H. L. Smith s.n. [July 27, 1885] (Ws), s.n. [July 27, 1887] (Ws); Ugent s.n. [July 31, 1960] (Ws); Van Arsdel s.n. [17 September 1952] (Ws); P. B. Whitford 1821 (Ws). Dunn Co.: Weinzirl s.n. [Jy. 23, 1894] (Ws). Grant Co.: Iltis 9448 (Ws); Iltis & Salaman 10103 (Ws); A. R. Moldenke 996 (Lw); L. H. Pammel s.n. [Muscoda, Aug. 15, 1930] (Io--136579); Shimek s.n. [Aug. 11, 1921] (Ws); H. H. Smith 7806 (B, Ws); Sylvester 101 (N); Ugent s.n. [July 25, 1960] (Ws). Green Co.: E. W. Fell 58-467 (Ws), 58-611 (Ws). Green Lake Co.: A. R. Moldenke 1017 (Lw). Iowa Co.: Iltis s.n. [end of June 1957] (Ws); A. R. Moldenke 1001 (Lw); Wills s.n. [July 27, 1957] (Ws). Jackson Co.: Grether 6613 (Ws). Jefferson Co.: Shinners 2400 (Ws); Wadmond 3769 (Dm), s.n. [Aug. 6, 1927] (Ws). Juneau Co.: Mearns 525 (W--670686); W. R. Taylor 2768 (Up--75581). La Crosse Co.: T. G. Hartley 1003 (W--2261909); King & Pammel s.n. [La Crosse, Aug. 26, 1901] (Io--22920); D. Pammel s.n. [La Crosse, 1902] (Io--22918); L. H. Pammel s.n. [La Crosse, Aug. 1882] (Io--15350); A. M. Peterson 187 (Ws); Ugent 433 (Ws). Lafayette Co.: Arnot s.n. [July 26, 1956] (Ws); Haggene, Melville, & Shaughnessy s.n. [Sept. 28, 1956] (Ws); P. K. Nelson s.n. [June 28, 1946] (Ws), s.n. [7 July 1946] (Ws); R. O. Wagner s.n. [Sept. 6, 1956] (Ws). Lincoln Co.: F. C. Seymour 12158 (Ws, Ws), 12263 (Ws). Marinette Co.: J. J. Davis s.n. [July 19, 1933] (Ws). Milwaukee Co.: J. S. Douglas s.n. [Wis.] (Je--3159). Monroe Co.: Iltis & Neess 8965 (Ws); A. M. Peterson 15 (Ws). Oconto Co.: Schlising & Schlising 1018 (Ws). Pepin Co.: O. Anderson 140 (Ws). Polk Co.: Patman, Long, & Struik 38 (Ws). Racine Co.: T. J. Hale s.n. (Ws); Shinners 4686 (Ws). Richland Co.: K. G. Foote s.n. [8-17-60] (Ws); M. A. Fosberg 337 (Ws). Rock Co.: R. B. Anthony s.n. [June 22, 1933] (Ws), s.n. [Sept. 26, 1936] (Ws); E. W. Fell 57-659

(Ws); Shinners s.n. [July 23, '89] (Ws); Wadmond 15734 (S); J. Wickham 14 (Ws), 37 (Ws). Sauk Co.: Cull 694 (Ws); Fassett 2689 (Ws); E. K. Jones s.n. [Aug. 22, 1948] (Ws); Koeppen 260 (Ws); Lemke 104 (Ws); H. H. Smith 7998 (B, Ws); Mrs. H. S. Young s.n. [July 2, 1936] (Cm). Shawano Co.: Honey s.n. [summer 1934] (Ws). Sheboygan Co.: Goessl s.n. [Sept. 1924] (Ws). Trempealeau Co.: Fassett & Wilson 9762 (In, Ws). Vernon Co.: H. H. Smith 7361 (B, Ws). Walworth Co.: Almon s.n. [Aug. 8, 1926] (Ws); Kleeberger s.n. [Whitewater, 8-25-1877] (Gg--31418). Washburn Co.: Goessl 8501 (B, Ws). Waukesha Co.: Fernholz s.n. [September 21, 1929] (Ws). Waupaca Co.: Goessl s.n. [July 28, 1910] (Ws); Rill s.n. [July 25, 1959] (Ws). Waushara Co.: Iltis, Bell, Melchert, Patman, & Witt 12469 (Ws); Pochmann s.n. [Sept. 1, 1959] (Ws). Wood Co.: L. S. Cheney 3647 (Ws). Blackhawk Island: Bramschreiber s.n. [June 30, 1959] (Ws). County undetermined: W. H. Chase s.n. [Wisconsin R. region, Aug. 1883] (Ws). MINNESOTA: Benton Co.: H. N. Moldenke 7785 (N). Big Stone Co.: Eifrig s.n. [Ortonville, July 20, 1929] (Up); Gier s.n. [Ortonville, VI.30.52] (Je--7183). Clay Co.: O. A. Stevens 1271 (Ca--952815, W--2034558, Wp). Clearwater Co.: Terrell 1789 (W--2388691). Fillmore Co.: J. L. Leedy s.n. [north of Rushford, June 29, 1937] (Bt--55364). Goodhue Co.: J. H. Sandberg 284 (B). Hennepin Co.: G. B. Aiton s.n. [Minneapolis, July '90] (N), s.n. [July] (Dt); F. H. Burglehaus 8466 (Se--14955); Chandonnet s.n. [Minneapolis, Aug. 22nd, 1910] (In); Eaton s.n. [Minneapolis, July 1890] (N); D. Houghton 29 (T); J. H. Sandberg 7566 (Fc), s.n. [Aug. 1879] (Ca--25172), s.n. [Aug. 1889] (Ca--25171, W--71935), s.n. [July 1891] (Dt); Schuette s.n. [St. Anthony, July 7, 1888] (N). Kandiyohi Co.: W. D. Frost s.n. [Willmar, July 1892] (Pl--22612, S, W--71936). Lyon Co.: L. H. Pammel s.n. [Marshall, Sept. 1918] (Io--94200). Ottertail Co.: Chandonnet s.n. [Perham, August 8, 1912] (Up--60537). Ramsey Co.: F. Blanchard s.n. [St. Paul, July 31, 1890] (Dt); Detwiler 8598 (La); Mearns 525 (W--649505, W--649506), s.n. [Fort Snelling, September 4, 1889] (W--670317). Renville Co.: C. MacMillan s.n. [Morton, July 1890] (Po--64647). Rock Co.: V. L. Harms 498 (Lw); P. Johnson 327 (Ky, Lb--36344). Waseka Co.: L. H. Pammel s.n. [Waseka, Aug. 1920] (Io--98732). Washington Co.: J. W. Moore 16667 (Ur), 16668 (We). Winona Co.: Hasse s.n. [Winona, July 1882] (N); Holzinger s.n. [Winona, Aug. '88] (Ca--199069), s.n. [Aug. 1901] (N, Vt); Hotchkiss & Jones 4164 (W--1622897). County undetermined: H. S. Young Jr. s.n. [8-10-1925] (Cm). NORTH DAKOTA: Cass Co.: O. A. Stevens s.n. [Fargo, July 25, 1934] (Ca--588086, Cm). Ransom Co.: O. A. Stevens s.n. [Lisbon, July 25, 1944] (W--2008469). Richland Co.: O. A. Stevens 318 (Ca--607217, Hi--192047, N, Ok, Um--212). SOUTH DAKOTA: Brookings Co.: L. H. Pammel s.n. [Brookings, Jul. 30, 1922] (Io--106919); J. J. Thornber s.n. [Brookings, August 1893] (Tu). Brown Co.: Griffiths s. n. [July 31, 1872] (Pl--22613). Cherry Co.: Tolstead s.n. [July 15, 1935] (Io--145164). Custer Co.: Barr s.n. [July 25, 1940] (Ba, Se--95483); Degener & Peiler 16269 (N, N, N); Hayward 1697 (Se--77057); Tollefson 16 (Sd--25294). Day Co.: J. F. Brenckle 39-92 (N), s.n. [July 22, 1938] (B). Deuel Co.: J. F. Brenckle 4602 (N). Fall River Co.: J. W. Barnhart s.n. [Hot Springs, June 13, 1894; Herb. J. H. Barnhart 642] (N);Rydberg 932 (W--211121). Hanson Co.: G. F. Weber s.n. [Farmer, 8-18-27] (Fl--21120). Hutchinson Co.: V. L. Harms 459 (Lw). Hyde Co.: Pammel & Fink s.n. [Highmore, June & July 1912] (Io--79613). Kingsbury Co.: J. J. Thornber s.n. [Iroquois, 8/11/94] (Ca--124662). Lawrence Co.: F. L. Bennett 42 (Ua--43209); W. P. Carr 118 (N, W--751127); H. E. Hayward 202 (N); P. Johnson 254 (Bt--62384, Ky, Lb--36500, N, Ur); G. N. Jones 19746 (Ur). Meade Co.: Forwood 299 (W--317831); Kemp s.n. [Bear Butte] (C). Mellette Co.: Moses s.n. [White River] (Pr); Tolstead s.n. [July 9, 1935] (Io--145165). Minnehaha Co.: H. N. Moldenke 7676 (N). Pennington Co.: O. M. Clark 6044 (B); H. N. Moldenke 7704 (N); Over 1507 (Bl--42344); Visher 1129 (Se--14952), 1507 (N). Spink Co.: J. F. Brenckle 47-533 (N); Petrak s.n. [31.VII.1950] (S, S); A. E. Ricksecker 48 (Ca--475441, Ob--50841, Po--215279, Um--211, Ur). Stanley Co.: Over 6168 (Bl--42337). Turner Co.: V. L. Harms 411 (Lw). Washabaugh Co.: Kienholz 47 (Ur). Yankton Co.: L. H. Pammel s.n. [Yankton, Aug. 6, 1919] (Io--96322). KANSAS: Allen Co.: A. S. Hitchcock s. n. [Allen Co., July 1896] (Ka). Anderson Co.: A. S. Hitchcock s. n. [Anderson Co., July 1896] (Ka); W. H. Horr s.n. [July 22, 1929] (Lw); A. R. Moldenke 880 (Lw). Atchison Co.: A. S. Hitchcock s.n. [Atchison Co., Oct. 1896] (Ka); Horr & McGregor s.n. [6/26/46] (Lw); Jeanette 72 (I); A. R. Moldenke 908 (Lw); Nolte 10 (I). Barber Co.: A. S. Hitchcock s.n. [Medicine L., July 1892] (Ka); Kellerman s.n. [Medicine Lodge, July 14, 1888 (Ka); R. L. McGregor 14068 (Lw), 14435 (Lw), 14463 (Lw), 14849 (Lw); J. D. Poindexter 201-46 (Lw); A. R. Moldenke 895 (Lw); B. L. Wagenknecht 4369 (Lw). Bourbon Co.: Kellerman s.n. [Ft. Scott, July 15, 1887] (Ka); Z. D. Thompson 587 (Lw). Brown Co.: Clothier & Whitford s.n. [July 29, 1897] (Ka); Garner s.n. [Aug. 1925] (Ka--72013); W. H. Horr 4482 (Lw); R. L. McGregor 17058 (Lw); A. R. Moldenke 915 (Lw). Butler Co.: J. Davis s.n. [Douglass, July 22, 1887] (Ka); W. H. Horr s.n. [8/6/29] (Lw); J. D. Johnson s.n. [July 1926] (Ka--71719). Chase Co.: Kellerman s.n. [Strong City, July 27, 1887] (Ka); B. L. Wagenknecht 4324 (Lw). Chautauqua Co.: W. H. Horr s.n. [July 5, 1930] (Lw); A. R. Moldenke 887 (Lw); B. L. Wagenknecht 1831 (Lw), 1853 (Lw). Cherokee Co.: N. B. Jacobs 46 (N); Kellerman s.n. [Columbus, July 13, 1887] (Ka); E. W. Lathrop 2619 (Lw); R. L. McGregor 1708 (Lw); J. D. Poindexter 207-27 (Lw). Cheyenne Co.: Bofman 22 (Ky), 311 (Ka--92665); V. L. Harms 1219 (Lw); A. S. Hitchcock s.n. [Cheyenne Co., June 28, 1897] (Ka); W. H. Horr 4689 (Lw); R. L. McGregor 9441 (Lw); Roach 411 (Au--122717). Clark Co.: A. S. Hitchcock s.n. [Clark Co., Aug. 1896] (Ka). Clay Co.: Kellerman s.n. [Clay Centre, July 2, 1888] (Ka); R. L. McGregor 5012 (Lw). Cloud Co.: Carleton s.n. [July 9, 1888] (Ka, Ur); S. V. Fraser 440 (Ka--78937). Coffey Co.: W. H. Horr 3475 (Lw, W--2030701); Wimpey s.n. [Burlington, July 1896] (Ka). Comanche Co.: A. S. Hitchcock s.n. [Comanche Co., Aug. 1898] (Ka); R. L. McGregor 14677 (Lw). Cowley Co.: Clothier & Whitford s.n. [Aug. 22, 1897] (Ka); R. L. McGregor 10397 (Lw); H. N. Moldenke 21926 (Lw). Crawford Co.: Clothier & Whitford s.n. [Aug. 12, 1897] (Ka). Decatur Co.: Kellerman s.n. [Oberlin, July 11, 1888] (Ka); R. L. McGregor 9478 (Lw), 13530 (Lw); E. L. Richards 1048 (Lw), 2860 (Lw). Dickinson Co.: A. S. Hitchcock s.n. [Dickinson Co., June 1896] (Ka); W. H. Horr s.n. [July 19, 1930] (Lw); H. N. Moldenke 21931 (Lw, Ut); J. B. S. Norton s.n. [September 1895] (Ka). Doniphan Co.: Clothier & Whitford s.n. [July 31, 1897] (Ka). Douglas Co.: Chamney 1 (Lw); Garrett 8466 (Se--14953); Kellerman s.n. [Lawrence, July 20, 1887] (Ka); R. L. McGregor 115 (Lw, S); J. D. Poindexter 37 (Lw), 229-6 (Lw), 229-20 (Lw); Snow s.n. [July] (Fl--21122); W. C. Stevens 6728 (Lw), s.n. [Lawrence] (W--216103). Edwards Co.: A. S. Hitchcock s.n. [Edwards Co., Sept. 1, 1897] (Ka); R. L. McGregor 10538 (Lw). Elk Co.: Clothier & Whitford s.n. [Aug. 20 & 21, 1897] (Ka); A. R. Moldenke 877 (Lw). Ellis Co.: A. S. Hitchcock s.n. [Ellis Co., August 1895] (Ka); Imler s.n. [June 20, 1928] (Lw); E. Runyon 175 (Bl--42348, Bt--44919, Cm, Go, Lb--33196, Ok, S, St--9263, Vt). Ellsworth Co.: A. S. Hitchcock s.n. [Ellsworth Co., July 1895] (Ka); R. L. McGregor 9260 (Lw), 12388 (Lw); A. R. Moldenke 899 (Lw); B. L. Wagenknecht 1907 (Lw), 1971 (Lw), 3232 (Lw). Finney Co.: Wilson & Miller 6728 (Lw), s.n. [7-22-12] (Lw). Ford Co.: Kellerman s.n. [Bucklin, June 26, 1888] (Ka). Franklin Co.: Hetzger 374 (Lw); A. S. Hitchcock s.n. [Franklin Co., July 1896] (Ka). Geary Co.: F. C. Gates 17504 (Ka--80314), 19957 (Au), 20509 (N); Gayle 510 (C); Hulbert 3298 (Lw); H. N. Moldenke 21932 (Lw); S. F. Norton s.n. [June 27, '94] (Ka). Gove Co.: A. S. Hitchcock s.n. [Gove Co., July 1895] (Ka); G. J. Inkenberry 59 (St--18206), s.n. [Sept. 10, 1918] (Ca--943061). Graham Co.: A.

S. Hitchcock s.n. [Graham Co., June 20, 1897] (Ka). Greeley Co.: M. Reed s.n. [Tribune, Aug. 5, 1892] (Ka), s.n. [Tribune, Sept. 11, 1892] (Ca--104870); Rose & Fitch 17074 (N, W--639221). Greenwood Co.: A. S. Hitchcock s.n. [Eureka, July '92] (Ka); W. H. Horr s.n. [July 28, 1930] (Lw); Ripley & Barneby 7251 (N). Hamilton Co.: C. H. Thompson 154 (Ca--181849, Ka, N, W--265840). Harper Co.: Kellerman s.n. [Harper, July 14, 1888] (Ka); A. R. Moldenke 889 (Lw). Harvey Co.: V. L. Harms 669 (Lw); Herrick s.n. [Aug. 1898] (Ka); Muck 82 (Ka--92760). Hodgeman Co.: A. S. Hitchcock s.n. [Hodgeman Co., August 1895] (Ka); R. L. McGregor 10595 (Lw). Jackson Co.: Norton & Clothier s.n. [July 5th, 1895] (Ka); M. Reed s.n. [Avoca, July 25, 1891] (Ca--25170); E. L. Richards 919 (Lw). Jefferson Co.: G. Latham 259 (Lw), 350 (Lw); D. L. Marsh 1613 (Hi-162048, Lw). Jewell Co.: R. L. McGregor 7377 (Lw). Johnson Co.: Kellerman s.n. [Olathe, July 7, 1887] (Ka). Kingman Co.: Branaman s.n. [July 29th 1895] (Ka); R. L. McGregor 10724 (Lw). Kiowa Co.: A. S. Hitchcock s.n. [Kiowa Co., Aug. 1896] (Ka). Labette Co.: A. S. Hitchcock s.n. [Labette Co., Aug. 1896] (Ka); B. L. Wagenknecht 1890 (Lw). Lane Co.: A. S. Hitchcock s.n. [Lane Co., August 1895] (Ka). Leavenworth Co.: Clothier & Whitford s.n. [Aug. 3, 1897] (Ka); Herb. Western Fem. Sem. s.n. [Stranger] (Pu); Sloan 4 (Ka--93196). Lincoln Co.: A. S. Hitchcock s.n. [Lincoln Co., July 1895] (Ka); R. L. McGregor 7446 (Lw). Linn Co.: Brooks & Brooks s.n. [1928] (Cm, Cm); Kellerman 1 (Ka); A. R. Moldenke 871 (Lw), 881 (Lw). Logan Co.: A. S. Hitchcock s.n. [Logan Co., July 1895] (Ka); R. L. McGregor 9408 (Lw), 17236 (Lw). Lyon Co.: H. A. Elmore s.n. [Emporia, July 1, 1922] (Je); R. L. McGregor 1885 (Lw); B. L. Wagenknecht 4180 (Lw). Marion Co.: Griffiths 5050 (W--496552); A. S. Hitchcock s.n. [Marion Co., August 1895] (Ka); R. L. McGregor 10764 (Lw). Marshall Co.: A. S. Hitchcock s.n. [Marshall Co., Dec. 10, 1896] (Ka); W. H. Horr 4548 (Lw). McPherson Co.: G. R. Babcock s.n. [Roxbury, June 23, 1887] (Ka). Meade Co.: W. H. Horr 3235 (Lw), 3275 (Lw), 3278 (Lw), 3450 (Lw, W--2030692), 3235 (N); Kellerman s.n. [Meade Centre, June 26, 1888] (Ka); J. D. Poindexter 166-17 (Lw). Miami Co.: A. S. Hitchcock s.n. [Paola, Aug. 1892] (Ka). Mitchell Co.: H. V. Dwyer s.n. [July 1896] (Ka). Montgomery Co.: A. S. Hitchcock s.n. [Montgomery Co., August 1896] (Ka); W. H. Horr s.n. [July 5, 1930] (Lw); A. R. Moldenke 882 (Lw); Rydberg & Imler 433 (N). Morris Co.: W. H. Horr s.n. [July 17, 1930] (Lw); R. L. McGregor 14134 (Lw); Trembly s.n. [Summer 1894] (Ka). Morton Co.: E. L. Richards 2959 (Lw), 3533 (Lw). Nemaha Co.: A. S. Hitchcock s.n. [Nemaha Co., Dec. 11, 1896] (Ka); Pettit 23 (Ka). Neosha Co.: W. W. Holland 130 (Lw); W. H. Horr 6728 (Lw).

Norton Co.: F. C. Gates 16900 (Ka--76273); W. H. Horr 5022 (Lw); Kellerman s.n. [Norton, July 11, 1888] (Ka); E. L. Richards 2781 (Lw). Osage Co.: W. H. Horr E.33 (B, Ca--45170, Lw, No--12402, Ok, S, Tl, Ur, Vi, W--2031022, We); Kellerman s.n. [Burlingame, July 21, 1887] (Ka); B. L. Wagenknecht 4040 (Lw). Osborne Co.: Dawley s.n. [1893] (Ka); Loomis s.n. [Alton, Oct. 1938] (Ka--90127); R. L. McGregor 7418 (Lw), 9626 (Lw); Neher 115 (Ka--80028); Shear s.n. [Summer 1894] (Ua--24447). Ottawa Co.: A. S. Hitchcock s.n. [Ottawa Co., July 1895] (Ka); H. N. Moldenke 21929 (F). Pawnee Co.: A. S. Hitchcock s.n. [Pawnee Co., August 1895] (Ka). Philipps Co.: A. S. Hitchcock s.n. [Philipps Co., June 29, 1897] (Ka); W. H. Horr 4767 (Lw); R. L. McGregor 9542 (Lw); E. L. Richards 2732 (Lw). Pottawatomie Co.: F. C. Gates 12613 (Ka--72797, Lb--27620); Kellerman s.n. [St. George, June 23, 1888] (Ka); L. D. Marsh 1735 (Hi--162532, Lw, W--2327297); B. L. Wagenknecht 3256a (Lw). Pratt Co.: A. S. Hitchcock s.n. [Pratt Co., Aug. 1896] (Ka); Hulbert 3189 (Lb--50539, Lw). Rawlins Co.: V. L. Harms 1244 (Lw); A. S. Hitchcock s.n. [Rawlins Co., June 1897] (Ka); R. L. McGregor 9460 (Lw). Reno Co.: A. S. Hitchcock s.n. [Tudor, July 1892] (Ka); R. L. McGregor 12510 (Lw). Republic Co.: G. E. Morley 232 (Lw); D. K. Thomas s.n. [Scandia, 1890] (Ka). Rice Co.: A. S. Hitchcock s.n. [Rice Co., August 1895] (Ka); B. L. Wagenknecht 4543 (Lw). Riley Co.: I. M. Atkins s.n. [Oct. 1, 1935] (St--21411); F. C. Gates 12660 (Mi); V. C. Hubbard s.n. [Sept. 1927] (Lb--27619); Maus s.n. [Rocky Ford, June 18, 1927] (Mi); J. B. S. Norton 391 (Ka, N, W--353118); Payne s.n. [Manhattan, August 1886] (Ur); M. Reed s.n. [Manhattan, 6-30-1892] (Ka); W. T. Swingle s.n. [Manhattan, June 20, 1888] (Ka). Rooks Co.: R. L. McGregor 9590 (Lw); Wilkin s.n. [June 15, 1887] (Ka). Rush Co.: A. S. Hitchcock s.n. [Rush Co., August 1895] (Ka). Russell Co.: A. S. Hitchcock s.n. [Russell Co., July 1895] (Ka); W. H. Horr 4937 (Lw); R. L. McGregor 5683 (Lw), 9283 (Lw). Saline Co.: Hancin 394 (Ka--76791); A. S. Hitchcock s.n. [Saline Co., June 1896] (Ka); H. N. Moldenke 21930 (Lw). Scott Co.: R. L. McGregor 9367 (Lw). Sedgwick Co.: T. L. Andrews s.n. [Whichita] (Io--28275, Io--28276); Herb. Wichita Univ. 12 (Lw); W. H. Horr s.n. [8/8/29] (Lw); A. S. Miller s.n. [Wichita, Mar. 1892] (Ka). Shawnee Co.: W. A. Dick s.n. [6-12-87] (Ob--50837); Maus 847 (Ka--72355, Um--206); Volle 202 (Lw), 232 (Lw). Sheridan Co.: A. S. Hitchcock s.n. [Sheridan Co., June 21, 1897] (Ka). Sherman Co.: F. C. Gates 16774 (Ka--76399); V. L. Harms 1207 (Lw, N); A. S. Hitchcock s.n. [Goodland, Jan. 1892] (Ka). Smith Co.: V. L. Harms 1312 (Lw); Kellerman s.n. [Smith Centre, July 10, 1888] (Ka); E. L. Richards 2891

(Lw). Stafford Co.: R. L. McGregor 13711 (Lw); A. R. Moldenke 897 (Lw); Ungar 788 (Lw). Sumner Co.: Kellerman s.n. [Argonia, July 26, 1887] (Ka). Thomas Co.: A. S. Hitchcock s.n. [Thomas Co., June 23, 1897] (Ka). Trego Co.: D. A. Horr 4173 (Lw); R. L. McGregor 9331 (Lw); M. Reed s.n. [July 8, 1892] (Ka). Wabaunsee Co.: Clothier s.n. [June 22, 1896] (Ka); Maus 30 (Ka--72469, Ob--50832). Wallace Co.: R. L. McGregor 17286 (Lw). Washington Co.: Clothier & Whitford s.n. [July 24, 1897] (Ka); W. H. Horr 4662 (Lw). Wichita Co.: M. Reed s.n. [Selkirk, Aug. 13, 1892] (Ka). Wilson Co.: Haller s.n. [Roper, June 26, 1896] (Ka); W. H. Horr s.n. [July 12, 1930] (Lw); A. R. Moldenke 878 (Lw). Woodson Co.: Clothier & Whitford s.n. [Aug. 29, 1897] (Ka); W. H. Horr s.n. [July 10, 1930] (Lw), s.n. [7/11/30] (Lw); E. W. Lathrop 558 (Lw, W--2235099), 698 (N), 963 (Lw); A. R. Moldenke 879 (Lw). Wyandotte Co.: M. Reed s.n. [Argentine, June 26, 1890] (Ka); E. L. Richards 3220 (Lw). County undetermined: Kleeberger s.n. [1876] (Gg--31417); S. Norton s.n. [Aug. 11, 1902] (Mi); C. A. Ripley s.n. [E. Kansas, July 20, 1890] (Ob--50797), s.n. [E. Kansas, June 19, 1895] (Ob--50833). MISSOURI: Adair Co.: C. S. Sheldon s.n. [Sept. 1, 1883] (Al). Barry Co.: B. F. Bush 210 (W--318221). Barton Co.: E. J. Palmer 5418 (Lb--50952). Bates Co.: H. N. Moldenke 21923 (Lw). Benton Co.: H. N. Moldenke 21920 (Lw). Boone Co.: Daniels s.n. [Columbia, Jun.-Oct. 1897] (Lb--9608), s.n. [Columbia, July 3, 1903] (Lb--4182, Lb--4190), s.n. [Columbia, July 1903] (Lb--4187); Favor s.n. [Columbia, Sept. 3, '01] (Lb--4189), s.n. [Columbia, June 22, 1902] (Lb--4188); Henson s.n. [June 30, 1940] (N); Rickett s.n. [Sept. 1926] (H--106466), s.n. [Rocheport, June 19, 1927] (Lb--7096); O. E. Thomas s.n. [Columbia] (Je--5345). Callaway Co.: Schwab s.n. [McCredie, July 1924] (Up). Camden Co.: A. R. Moldenke 858 (Lw). Chariton Co.: Mrs. H. S. Young s.n. [June 23, 1925] (Cm). Clay Co.: B. F. Bush 12696b (Bt--15496); C. J. Elmore s.n. [Liberty, Aug. 25, 1923] (Je--3160); Gier 8132 (S); K. K. Mackenzie 261 (S). Clinton Co.: C. R. Barnes s.n. [Converse, 8-4-77] (Pu). Crawford Co.: A. R. Moldenke 848 (Lw). Franklin Co.: D. L. Marsh 1663 (Lw); J. M. Mason s.n. [Meramec State Park, 7/15/35] (Lb--34371); A. R. Moldenke 847 (Lw). Greene Co.: Blankinship s.n. [Willard, July 9, 1919] (Po--63848); J. I. Cantrell s.n. [Springfield, June 17, 1929] (Lb--14483); P. C. Standley 8325 (W--687286). Grundy Co.: Crookshanks 135 (Lb--29649). Henry Co.: H. N. Moldenke 21921 (Lw). Hickory Co.: A. R. Moldenke 861 (Lw). Iron Co.: L. H. Pammel s.n. [Pilot Knob, June 17, '88] (Io--15351). Jackson Co.: B. F. Bush 426 (C), 475 (C), s.n. [7-2-1892] (Lb--4183); Erisman s.n. [Kansas City, June 26, '94] (Ah); K. K. Mackenzie s.n. [July 17, 1900] (N). Jasper

Co.: Demaree 39337 (Bm). Lincoln Co.: A. R. Moldenke 842 (Lw). Maries Co.: H. N. Moldenke 21917 (Lw). Marion Co.: J. Davis 2791 (Um--210), 3227 (Se--14951), 4461 (Du--202359), 6246 (Um--209), FDM (Ur), s.n. [near Hannibal, 9-6-13] (In), s.n. [Hannibal, 17-7-13] (Au, Au), s.n. [Hannibal, 24-6-14] (Mi), s.n. [Hannibal, 14-7-14] (Au), s.n. [Hannibal, 20-7-15] (Gg--216419). Miller Co.: A. R. Moldenke 856 (Lw). Nodaway Co.: J. R. Singleton 106 (Lb--34596). Ozark Co.: Leopold s.n. [10.9.39] (Lb--48919); Rickett s.n. [Rock Bridge, June 26, 1927] (Lb--7094). Pemiscot Co.: A. J. Davis s.n. [Hamlin, July 7, 1917] (Se--15988). Phelps Co.: Drouet s.n. [July 12, 1931] (Lb--9247); A. R. Moldenke 849 (Lw). Pike Co.: Fritchey 559 (Lb--4184). Platte Co.: Radloff s.n. [July 24, 1956] (Ur), s.n. [July 25, 1956] (Ur). Ralls Co.: J. Davis 40 (Ur), 3779 (Ur). Reynolds Co.: R. L. McGregor 17195 (Lw). Saint Louis Co.: Collector undesignated s.n. [Between St. Louis & Iron Mts., Aug. 24, 1878] (W--221165); M. Craig s.n. [West Richmond, Aug. 1912] (Ca--181682); Eggert s.n. [Herb. Geete 5709] (Go); Glatfelter s.n. [near St. Louis, 7-20-92] (Mi); Letterman 14 (Po), s.n. [Allenton, June 28, 1911] (Io--76363), s.n. [Allenton, July 6, 1911] (Or--14360); H. N. Moldenke 21798 (Mi); L. H. Pammel s.n. [Jefferson Barracks, 6-1888] (Io--22914); L. F. Ward s.n. [Aug. 22, 1878] (W--147587). Stone Co.: B. F. Bush s.n. [Oct. 9, 1936] (Md); Z. Williams s.n. [Hurley, August 1927] (Lb--4191). Taney Co.: D. L. Spencer s.n. [7-25-40] (Lb--35420, Lb--48920). Warren Co.: A. R. Moldenke 844 (Lw). Wayne Co.: E. J. Palmer 6107 (Po--217514, W--1581049). Wright Co.: Lansing 3164 (Ur). Saint Louis: Drummond s.n. [1832] (C); Eggert s.n. [12 July 1877] (S); Engelmann 339 (Pr), s.n. [St. Louis, July 1839] (S), s.n. [St. Louis, Aug. 1841] (W--71934); Fendler s.n. [Herb. Krause 16832] (B); F. D. Kelsey s.n. [Sept. 1894] (Ob--50838); M. Martens s.n. (Br, Br); B. H. Patterson s.n. [St. Louis, Oct. 1, 1904] (Cm); Riehl 196 (Br, M). County undetermined: Z. Baldwin s.n. (Au); Buckley s.n. (T); Engelmann s.n. [July 1839] (Br, Br); Geyer s.n. [Upper Missouri, July] (C); Pringle s.n. [Southeastern Missouri, 30 July 1885] (Vt); Spillman 298 (Pl--22615). ARKANSAS: Baxter Co.: Demaree 20675 (N, Sm), 23606 (Sm), 29314 (N). Benton Co.: Heacox s.n. [July 20, '89] (Ob--50834). Boone Co.: Demaree 30203 (Au--122703, Au--122725, N, Ok, St). Clay Co.: Demaree 27030 (N). Conway Co.: Demaree 37218 (Sm). Craighead Co.: Demaree 5085 (Ok), 27113 (Au--122704, N, Ok, St). 30772 (N). Faulkner Co.: F. A. Haas 1673 (W--1654392). Franklin Co.: Ruth 31 (W--1522032). Garland Co.: Scully 334 (Ky). Green Co.: Demaree 26698 (Au--122712, N, Ok, St). Hot Spring Co.: Demaree 17889 (N), 17962 (N); R. E. Earle s.n. [Malverne, July 19, 1877] (N). Independence Co.: Demaree 23800

(Sm), 26792 (N). Izard Co.: Demaree 22745 (Sm), 23376 (Sm), 23378 (Sm). Johnson Co.: Demaree 19995 (N, Sm). Lawrence Co.: Demaree 25748 (N), 26152 (Au--122738, N). Logan Co.: Demaree 17723 (N, Ok), 25194 (Bm); Pyle 928 (De); Welch 1121 (Dp); Mrs. H. S. Young s.n. [June 16, 1925] (Cm). Marion Co.: Demaree 29151, in part (Au--122707, N, St), 30032 (N), 30909 (Au--122706, Le), 47937 (Lw). Mississippi Co.: McAtee 2053 (N, W--587275). Phillips Co.: Demaree 15224 (Du--256558, Gg--267615, H--97679, Ok), 15244 (Ky, N, Pl--131530, Ur, Ur), 19251 (N, Sm). Poinsette Co.: Demaree 17568 (N, Ok). Pope Co.: Demaree 19871 (Mm, N, Sm). Pulaski Co.: Coville 3 (W--210602); Demaree 8365 (Bt--11509, W--1582394); F. W. Pennell 10654 (N). Randolph Co.: Demaree 29179 (N), 30963, in part (Au--122705, Le, Ok); R. D. Hamilton s.n. [Current River, 8/2/38] (Cm). Searcy Co.: Demaree 22251 (Hi--170690, Lb--53414, N, Sm). Sebastian Co.: Bigelow s.n. [Fort Smith, 1853--4] (W--71933); Rolfs s.n. [Ft. Smith, Aug. 1891] (Io--32271). Sharp Co.: Demaree 26270 (Au--122737, N). Stone Co.: Demaree 23495 (Sm), 27831 (N). Van Buren Co.: Demaree 22274 (N, Sm). Washington Co.: Braly s.n. [Fayetteville, July 19, 1893] (St); Demaree 22435 (N, Sm), 22453 (Lb--53415); F. L. Harvey 61 (Cm, Cm, Mi, Ur), 261 (Pa), s.n. [Fayetteville, May] (Ur); Nix s.n. [June 7, 1893] (Ok). County undetermined: F. L. Harvey s.n. [Curtiss 1958] (Bc, C, Cm, Pa, Vt). MONTANA: Big Horn Co.: Blankinship s.n. [Crow Agency, July 14, 1901] (Fc). Missoula Co.: Kirkwood 1822 (Ca--352291, Mn--17746, N). IDAHO: Kootenai Co.: J. H. Christ 11832 (N); C. Epling s.n. [Post Falls, July 1929] (La); Milburge 969 (Se--15930). WYOMING: Albany Co.: C. L. Porter 7151 (Au--122709, Ca--39483, Gg--407318, Mg, N). Laramie Co.: Cantrell s.n. [8/15/47] (Ok); F. V. Hayden s.n. [Camp Carlin, July 1870] (Pa); A. Nelson 538 (Ur). Platte Co.: A. Nelson 505 (C, Cm, Ur, W--284504). Weston Co.: Degener & Peiler 16180 (N, N, N). County undetermined: F. V. Hayden s.n. [Aug. 1 -- Sept. 13, 1870] (W--235940). UTAH: Utah Co.: A. O. Garrett 3172 (S). COLORADO: Baca Co.: Weber & Anderson 5204 (Ca--945429, No--23718). Boulder Co.: W. A. Weber 5270 (No--23646). Cheyenne Co.: Heustis s.n. [Cheyenne Wells, July 25, 1906] (Bl--42311). Denver Co.: Eastwood 90 (Bl--42334, Ca--148062, Gg--31424, St--22948, W--582335). Elbert Co.: Demaree 29416 (Le). El Paso Co.: Bacigalupi 931 (Du--195879); Biltmore Herb. 4758a (S); Ferril s.n. [Sept. 1, 1902] (Bl--42313). Jefferson Co.: Bethel s.n. [Wheatridge, Aug. 16, 1916] (Gg--31422); Heustis s.n. [Wheatridge, 8-16-16] (Bl--42335). Kit Carson Co.: Ownbey 1363 (Ca--590153, Ca--882815, Id, Mn--31207, N, Pl--83803, Se--31567, Ua--34285). Las Animas Co.: C. M. Rogers 6076 (Au--122716), 6111 (W--2053608), 6956 (W--2000602). Logan Co.: Osterhout s.n. [Sterling, July 6, 1932] (Po--191051). Prowers Co.: Collector undesignated s.n. [Arkansas valley in eastern Colo.] (Fc). Washington Co.: Piemeisel 1576 (W--584372). Yuma Co.: Eggleston 15224 (Dt), 15528 (W--1112861); Ewan 12917 (En); Harrington & Smith 417 (Fc); Piemeisel 1533 (W--584326); Ramaley 12768 (Bl--42362). County undetermined: J. L. Sheldon s.n. [Engelmann's Canon, Aug. 5, 1903] (We). NEBRASKA: Adams Co.: J. H. Barnhart 468 (N). Buffalo Co.: "W. E. B." s.n. [Aug. 1922] (Ok--10361); J. H. Holmes s.n. [Kearney, Aug. 1889] (Fc--2505, W--71938). Antelope Co.: Rohrbaugh 41 (Au--122724). Cass Co.: M. E. Day 221 (Ob--99771); H. N. Moldenke 21936 (Lw); J. L. Morrison 1218 (Go). Cedar Co.: F. E. Clements 2663 (Ca--124661, W--71944). Cherry Co.: Tolstead 415 (Bt--35085). Cheyenne Co.: Osterhout s.n. [north of Sidney, July 7, 1932] (Po--216659). Custer Co.: C. L. Dietz s.n. [24 July 1927] (Se--21475); H. J. Webber s.n. [Anselmo, July 8, 1889] (W--216329). Douglas Co.: Eastman s.n. [Omaha, Aug. 16, 1915] (Ur); Kleeberger s.n. [Omaha] (Gg--31420). Greeley Co.: Nolte 99 (I). Harlan Co.: L. H. Pammel s.n. [Alma, June 21, 1897] (Cm). Hooker Co.: Rydberg 1422, in part [near the forks of the Dismal River, Hooker County, on prairie, July 11, 1893] (C). Kearney Co.: H. Hapeman s.n. [Minden, July 1, 1833] (Gg--237860), s.n. [June 23, '91] (Hp), s.n. [July 14, 1930] (En--2509), s.n. [Minden, 1930] (Po--213214), s.n. [Minden, June 29, 1932] (Bt--12318, Ua--11390), s.n. [Minden, June 26, 1933] (Ca--512294, Ew, Ew), s.n. [July 1, 1933] (I, Id), s.n. [Minden, July 6, 1937] (Sd--23838). Keith Co.: C. O. Erlanson 2260 (Mi); M. E. Jones s.n. [Ogalalla, June 16, 1925] (Po--118078). Knox Co.: Krautter s.n. [Niobrara Reserve, July 1903] (Up). Lancaster Co.: Herb. Okla. Coll. Women 311 (Ok); Herb. Univ. Nebr. 259 (Au); Pipal s.n. [Lincoln, 6-9-11] (Ah); Seal s.n. [Lincoln, June 30, 1897] (W--2311053); J. L. Sheldon s.n. [Lincoln, September 1897] (We); Whited 2686 (Or--12379). Lincoln Co.: F. G. Miller s.n. [7-17-01] (Io--22904, Io--22915); Plank s.n. [North Platte, July 1896] (N). Merrick Co.: A. A. Heller 14290 (Du--156905, Se--88043). Nance Co.: L. B. Curtis s.n. [Genoa, June 22, 1903] (Ok--10363). Nemaha Co.: H. N. Moldenke 21934 (Lw); J. L. Sheldon s.n. [Peru, July 21, 1900] (We), s.n. [Peru, August 1900] (We); Shubert s.n. [Peru, July 1933] (Ob--50798); Vance s.n. [Peru] (Bt--18923); J. M. Winter 20 (W--1679069). Oteo Co.: A. E. Allen s.n. [Talmage, July 11, 1891] (Je); H. N. Moldenke 21935 (Lw); Wibbe s.n. [Salina, Sept. 1881] (Du--91129). Phelps Co.: McMillan s.n. [Holdrege] (Io--53117). Pierce Co.: V. L. Harms 581 (Lw). Platte Co.: Clevenger s.n. [Columbus, June 21, 1904] (La). Richardson Co.: Grinstead 85 (Ky); H. N. Moldenke 21933 (Lw). Scotts Bluff Co.: F. G. Miller s.n. [Aug. 19, 1901] (Io--22916). Sheridan Co.: R. E. Buchanan s.n. [Spade

Ranch, August 2--20, 1905] (Io--46519); J. B. Hatcher s.n. [on the Running Water, July 1--10, 1886] (Ca--25173), s.n. [July 1886] (Pr). Thomas Co.: Krautter s.n. [Halsey, July 23, 1907] (Up--45720, Up--45742, Up--45743, Up--45744, Up--45747); Rydberg 1422 (C, W--210363). Washington Co.: Conard S.279 (Se--19993); Lallman s.n. [July 5, 1931] (Bt--32238). County undetermined: E. K. Abbott s.n. (Gg--31425); F. E. Clements s.n. [Nebraska, 1893] (W--71942); F. V. Hayden s.n. [Bad Lands, 1856] (Dt); LeRoy s.n. [Nebraska] (C); R. de Lima 101 [Oregon Trail] (I); McClatchie s.n. [Endell, July 1889] (N); B. H. Patterson s.n. [July 6, 1895] (Cm). OKLAHOMA: Adair Co.: C. S. Wallis 2387 (St). Atoka Co.: V. L. Cory 56792 (St). Beaver Co.: Hindman 234 (St), 254 (St). Beckham Co.: B. Osborn 1368r (Ok). Bryan Co.: W. S. Blain s.n. [Durant, June 23, 1935] (Bt--29681). Caddo Co.: C. T. Eskew 1089 (Ok); Edw. Palmer 243 (C, Du--177391), 244 (T, W); Van Vleet 34 (Ok--10331, Ok--10329). Canadian Co.: D. B. Dunn 13325 (Lb--43627); A. R. Moldenke 114 (Fg). Carter Co.: Collector undesignated 1614 (W--1466833); Kinnan 91 (Ok). Cherokee Co.: R. Bebb 4376 (Ok); Bradfield & Blythe s.n. [7/10/24] (St--9267); Prier s.n. [July 1, 1924] (St--9268); C. S. Wallis 4037 (St). Choctaw Co.: H. W. Houghton s.n. [Stevens 4000] (N). Cleveland Co.: Babb 108 (Ok--10319); Bayliff s.n. [July 11] (Ok--10326); Bruner 11376 (H--5479), s.n. [Norman, 6/15/24] (Io--117042, Ok--10332, Or--18976); Collector undesignated s.n. [Lexington, 7-3-19] (Wi); Demaree 13077 (Ok--20377); Fielder 100 (Ok--10320); Flowers 67 (Ok); George 29 (Ok); Gowan 46 (Ok--10327); Jeffs s.n. [5/30/1921] (Ok--17535); L. Martin s.n. [6-26-28] (Ok--10337); W. S. Myers 55 (Ok), s.n. [June 22, 1926] (Ok); Personett 52 (Ok--10334); Stemen 136 (Ok); C. Whaley 22 (Ok--10321). Comanche Co.: M. K. Clemens 11748 (Ba), 11748a (Ba); Demaree 12996 (Ca--717793, N, Ok--22239); Kaeiser 33 (Ok); G. W. Stevens 1354 (Ur), 1354 1/2 (Ok). Craig Co.: Waterfall 8193 (Ok). Custer Co.: Jeffs s.n. [June 18, 1930] (Ok--10338); Mericle 1629 (Ok). Delaware Co.: Goodner 42 (Ca--882817). Ellis Co.: G. W. Stevens 2930 (Ok). Garfield Co.: Gephardt 769 (Ok). Garvin Co.: C. Kennedy 317 (Ok). Grady Co.: Albers 46 (Ok); Spears 91 (St--9264); Wall 3 (Ok). Greer Co.: G. W. Stevens 1034 (Du--65525, Ok, St--9266, Ur). Harper Co.: Stratton 403 (St--26129). Kay Co.: W. W. Barkley s.n. [July 1929] (Ok--13759); Davy s.n. [July 11, 1939] (St--17554); G. W. Stevens 1865 (Ok, St--9262); J. J. Taylor 18 (St). Kingfisher Co.: Mrs. E. E. Bogue 1387 (No--8617); Byers 7 (St--17552). Latimer Co.: O. M. Clark 2804 (Ok--10318). Leflore Co.: Blakley s.n. [G. W. Stevens 1457] (Du--66340, Ok, St--9265, Ur, W--589571); "R. E. J." s.n. [Winding Stair Mts., 6/30/19] (Ok--

10335). Lincoln Co.: O. M. Clark 2245 (B). Logan Co.: C. C. Smith G.689 (Ok—16362). Marshall Co.: G. J. Goodman 6475 (Bs, Ok, Z); Kelting 181 (Ok); P. B. Riggs 1981 (S); Starks s.n. [8 July 1950] (Ok). Mayes Co.: Flowers 427 (Ok); C. S. Wallis 3348 (St), 7674 (Au—171439, St). McClain Co.: Harding 553 (St—20329); M. Hopkins 13364 (Ba, Ok—20523, St—12770); C. C. Smith 550 (Ok), 809 (Ok); Stratton 4770 (St—26143), 4771 (Ml, N, St—26144, St—26145). McCurtain Co.: Puckette 38 (Au—122714). Murray Co.: Emig 42 (Cm), 787 (Cm); C. T. Eskew 1019 (Ok); M. Hopkins 1168 (Ok), 5207 (Ok), 5410 (Ok, Ok), 6023 (Ok); Hopkins & Cross 6450 (Ok); Hopkins, Nelson, & Nelson 659 (Ok); McLennan 122 (St—24885); Merrill & Hagen 599 (Ok—19976); G. Mitchell 505 (Ok); Rutledge & Gage 581 (Ok—10333); Stratton 4730 (N, St—26139, St—26140). Muskogee Co.: R. Bebb 5017 (Ok, Ok); E. L. Little 181 (Ok—10336), 1583 (Ok—10325), 1935 (Ok—10324); W. Purcell 63 (Ok); C. S. Wallis 4584 (St); Waterfall 10269 (St). Oklahoma Co.: A. R. Moldenke 113 (Fg); Waterfall 1483 (Ok, St). Okmulgee Co.: Autry 81 (St). Osage Co.: Harding 59 (St—17563); Sizemore 272 (St). Ottawa Co.: E. B. Miller 62 (St—24972); G. W. Stevens 2308, in part (Du—66376), A.2312 (St—9261). Pawnee Co.: Stratton 249 (St—26125). Payne Co.: S. E. Myers s.n. [Stillwater, Aug. 20, 1897] (Ca—882821); Waterfall 114 (St). Pittsburg Co.: Mauldin s.n. [near McAlester, July 19, 1942] (Rf); McClary 58 (Ok—16286). Pontotoc Co.: Duffer 123 (St); D. McCoy 720 (St), 906 (St), 1717 (St); G. T. Robbins 2742 (Ca—966176, N, Ok), 3176 (Ca—904344, Ok); Stratton 6169 (Hi—152269, Ml, N, St—26161). Pottawatomie Co.: E. D. Barkley 249 (Ok—16731), 1485 (Mn—28630); F. A. Barkley 1485 (Ca—882814); Demmer 19 (Ok); Hopkins & Demaree 8 (Ok); Jacobs 19 (Ok). Rogers Co.: Waterfall 1454 (N, St). Sequoyah Co.: C. S. Wallis 4489 (St). Tulsa Co.: M. B. Clark 366 (St); Force s.n. [6/25/28] (Ok—10323); Gatti 689 (St—9259); Markley 71 (Se—69272); Prewett 5 (Au); Stoneman s.n. [Sept. 24, 1938] (St—14167); Tenney s.n. [June 22, 1931] (I). Washington Co.: D. Mc Lean 274 (St—17802). Woods Co.: P. J. White s.n. [July 4, 1900] (In). Woodward Co.: J. P. Kimball s.n. [Fort Supply, June 22, 1891] (Ka); L. F. Locke 15 (W—1582636). County undetermined: R. Bebb 4376 (Ok); Clifton 6 (Ok—10328); G. M. Merrill 625 (N); Sawyer & Schultz s.n. (Ok—10330); G. W. Stevens 875 1/2 (Ok), 2312 (Ok), A.1457 (Ok). TEXAS: Cook Co.: Straudtmann s.n. [July 26, 1941] (Au). Dallas Co.: Boll s.n. [1871] (Cb, Cb); J. Reverchon s.n. [Dallas, May 1877] (Bc); Mrs. J. P. Stephenson s.n. [Ennis, May 6, 1928] (Ld). Gonzales Co.: Tharp s.n. [Palmetto State Park, 6/26/39] (Au, Au). Grayson Co.: H. Gentry 316 (Au—122652); Hennen 221 (St). Hemphill Co.: Cory 50269 (Au, Ca--754836, N, Sm, W--1885937); C. M. Rowell 4115 (Au--192086); Tharp 4502 (Au). Liberty Co.: Warner s.n. [Liberty] (Hu). Lipscomb Co.: A. H. Howell 64 (W--500189). Polk Co.: D. Lynch s.n. [August 8, 1947] (Au--122699). Red River Co.: E. Adams s.n. [6-19-37] (Nt). Tarrant Co.: Ruth 162 (Ll), s.n. [Fort Worth, Aug. 27, 1909] (Po--267629). Wheeler Co.: W. P. Taylor s.n. [Aug. 1, 1941] (Au). County undetermined: M. R. Stephenson 201 (W--1580539). NEW MEXICO: County undetermined: Mrs. O. Saint John s.n. [Uplands, Catskill, Aug. 1895] (Lb--9608). ARIZONA: Coconino Co.: B. L. Wagenknecht 4809 (Lw). WASHINGTON: Stevens Co.: Kreager 475, in part (Ca--882827, N, Pl--22578, Se--68370, Um--208, W--441291). MEXICO: Guerrero: F. A. Barkley 14079 (Au). CULTIVATED: Belgium: M. Martens s.n. [hort. insul. 1827] (Br), s.n. [h. b. lov. 1839] (Br). Denmark: Herb. Mus. Bot. Stockholm s.n. [Ex horto Havn.] (S). England: Stead s.n. [Liverpool Garden] (T). France: Herb. W. H. Harvey s.n. [h. R. P. 1820] (Du--166445). Germany: Collector undesignated s.n. (Gg--31415); Herb. Martius s.n. (Br); Rodrian s.n. [botan. Garten Heidelberg] (La). New Jersey: G. H. M. Lawrence P.528 (Ba); Lawrence & Lawrence P.240 (Ba). Pennsylvania: Martindale s.n. [Germantown, Sep. 1876] (W--771850); T. Meehan s.n. [1885] (Up--17125). Spain: Herb. Hort. Bot. Matrit. s.n. (Cp). Sweden: Herb. Beurling s.n. [1842] (S), s.n. [1844] (S). Switzerland: Herb. Hort. Bot. Basil. s.n. [1850] (M). LOCALITY OF COLLECTION UNDETERMINED: Collector undesignated 2109 (S), s.n. (S); Engelmann s.n. [Amer. bor.] (Br); Friesner s.n. (Bt--2484); Geyer 104 [near Missouri River] (W--71945); Herb. Molliano s.n. [Panzero] (Br); Herb. Torrey s.n. [North Fork of the Platte] (T); D. Houghton s.n. [Falls of St. Anthony, July 1832] (Mi); James s.n. [Long's 1st Exped.] (C); Werner s.n. [Aug. 30, 1885] (Ob--97294); A. Wood s.n. (Pa). MOUNTED ILLUSTRATIONS: C. A. Ripley s.n. [in color] (Ob); Curtis, Bot. Mag. 45: pl. 1976 [in color]. 1818 (N).

VERBENA STRICTA f. ALBIFLORA Wadmond, Rhodora 34: 19. 1932.

Synonymy: Verbena striata var. alba Popenoe ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena hastata x stricta Allen ex Moldenke, Résumé 365, in syn. 1959. Verbena stricta var. alba Fuller ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963. Verbena stricta alba Gates ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963. Verbena stricta f. alba Wadmond ex Moldenke, Résumé Suppl. 10: 7, in syn. 1964.

Bibliography: Wadmond, Rhodora 34: 19. 1932; Perry, Ann. Mo. Bot. Gard. 20: 286 & 356. 1933; Truman, Rhodora 40: 244--245. 1938; N. F. Petersen, Amer. Bot. 45: 166--167. 1939; Moldenke, Prelim. Alph. List Invalid Names 48. 1940; Moldenke, Suppl. List Invalid

Names 10. 1941; Moldenke, Alph. List Invalid Names 58. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 6, 7, 9, 11, 12, & 102. 1942; Moldenke, Castanea 10: 39. 1945; Moldenke, Phytologia 2: 74 & 117. 1945; Moldenke, Alph. List Cit. 1: 109, 217, 224, 244, & 267. 1946; Moldenke, Phytologia 2: 383. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 26. 1947; Moldenke, Alph. List Cit. 2: 391, 400, 401, 406, 514, 517, 520, 544, 605, & 620 (1948) and 3: 800, 826, 904, 927, & 949. 1949; Moldenke, Phytologia 3: 131. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 12, 14, 15, 17, 20, 21, & 199. 1949; M. L. Grant, Proc. Iowa Acad. Sci. 57: 118. 1950; Moldenke, Revist. Sudam. Bot. 8: 166. 1950; Fern. in A. Gray, Man. Bot., ed. 8, 1211. 1950; Moldenke, Phytologia 4: 67. 1952; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 129 (1952) and print. 2, 3: 129. 1958; Moldenke, Am. Midl. Nat. 59: 359. 1958; Moldenke, Résumé 16, 18, 19, 21, 23, 25, 26, 365, 374, & 474. 1959; Moldenke, Résumé Suppl. 1: 1 (1959), 2: 2 (1960), 3: 4—7 (1962), 4: 3 (1962), 6: 2 (1963), and 7: 2 & 10. 1963; Moldenke, Phytologia 9: 206 & 220. 1963; Steyerm., Fl. Mo. 1260, map 1842. 1963; Moldenke, Résumé Suppl. 10: 1 & 7 (1964) and 11: 3. 1964; Moldenke, Phytologia 11: 117 & 118. 1964.

This form differs from the typical form of the species in having its corollas purplish-white, nearly white, or pure-white.

The type of the form was collected by Samuel Christiensen Wadmond in southeastern Wisconsin. In the original description of the form no specific type is designated, but the author states that it is deposited in the Gray Herbarium of Harvard University. He says "seemingly rare; seen only once, along roadside where it was interspersed with the normal purple-flowered form." Other collectors describe the form as 2—3 feet tall, and it has been collected in sandy soil and sandy loam, in open upland forests, sandy or grazed pastures, sandy waste places, ditches and open roadside ditches, low marshy areas along small creeks, and sand of hog-lots, along rivers, roadsides, open roadsides, and railroad tracks, and on dry bottoms, hilly prairies, bare bluffs, and sand prairies, to 800 feet altitude, flowering from June to September, and fruiting from June to August.

Material has been identified and distributed in herbaria as V. stricta Vent. and as "Verbena stricta x --". The Cinq-Mars s.n. [31 juillet 1951] and A. S. Hitchcock s.n. [Ames, July '82] are mixtures with typical V. stricta Vent. Common names recorded for the plant are "hoary vervain" and "white-flowered verbena". In my 1940 publication I followed Perry (1933) in regarding it as synonymous with V. stricta, but I now regard color forms such as this as worthy of distinct nomenclatural recognition.

Verbena hastata x stricta Allen is apparently based on A. E. Allen s.n., collected at Peru, Nemaha County, Nebraska, on August 2, 1893, and deposited in the herbarium of William Jewell College at Liberty, Missouri; V. striata var. alba is based on E. A. Popenoe s.n. collected at Topeka, Shawnee County, Kansas, on July 23, 1879, and deposited in the herbarium of Iowa State College at

Ames, Iowa; V. stricta var. alba is based on G. D. Fuller 1123, collected in an open upland forest in Earl Township, Section 21, La Salle County, Illinois, on September 10, 1918, and deposited in the herbarium of the University of Illinois at Urbana; and V. stricta alba is based on F. C. Gates 3608, collected along the Illinois Central Railroad tracks southeast of Havana, Mason County, Illinois, on July 6, 1910, and is deposited in the herbarium of the University of Illinois.

Hayden says "a colony of pure white flowered plants was growing near the purple form" in Iowa, while Isely says "mixed with the blue form along roadside" and Harms found "a very large colony about 1/4 white" in the same state. Schneck comments "flowers all pure white; two stalks 4 feet apart standing among stalks that bore the usually colored flowers" in Illinois, while, in the same state, Chase says "locally not rare in sand prairie".

In Kansas Horr reports "about 50 plants growing with V. stricta in loam with fair moisture" and "not common in dry loam, grasslands", Morley discovered a "small group in grazed prairie pasture in sandy loam soil", and McGregor found a "large colony of white form in overgrazed sandy pasture" and a "colony of white form in prairie pasture ravine". Poindexter 201-68 was found in a broad ravine below a pond and proved to have 95 percent pollen fertility and a chromosome count of $n = 7$.

Over notes that in South Dakota "about 1 in every 100 was white". Terrell says "no color transition; with and outnumbering the typical form in sandy waste places by roadside" (in Wisconsin), Wallis reports "large colony, 25 percent white, 75 percent deep purple" (in Oklahoma), and Demaree notes "all these were white, many others were blue" (in Arkansas). The Davidson, Dixit, & Romberg 4689, cited below, is described by the collectors as "flowers white and lavender" and so is probably a mixture with f. roseiflora Benke.

Truman (1938) says: "In the summer of 1934 the writer observed a very few plants of Verbena stricta Vent. forma albiflora Wadmond ....scattered in a patch of the typical purple-flowered form of V. stricta in a pasture about two miles east of Rockton, Illinois, and several miles to the west of the station reported by Wadmond.. in 1932. Continued observation of the colony during the summer of 1935 and 1936 revealed the fact that the white-flowered form was increasing in numbers and spreading to the adjacent roadside. In 1937 it was noted that not only had this form increased in its importance in the original station, but also that several specimens had appeared in a farmyard a half mile distant. Members of the family living upon the farm where the white-flowered form was first noted remember that in 1933 the station consisted entirely of purple-flowered plants. Their observation is not reliable, however, for in 1934 the relative number of white-flowered plants was so small as to be evident only to a practised observer.

"This form differs from the typical V. stricta not only in that its flowers are pure white, but also that its stems completely lack the purple color that is invariably characteristic of the purple-flowered form. These differences seem to indicate that some change has taken place in the genetic make-up of the plant to inhibit the development of the pigment, presumably anthocyanin, which gives the typical form its color. In all other respects the white-flowered form resembles the typical, although in a dozen specimens tagged at random early in the season and collected near the end of the flowering period for the purpose of obtaining seeds, the white-flowered plants were all notably taller, sturdier plants than the purple-flowered. This difference may have been purely accidental. At no time in the four years in which this station has come under the observation of the writer has there appeared any intermediate form. All individuals have been either typical V. stricta, or pure white. It is interesting to note here that this lack of intermediates has been observed by Benke....... where V. stricta Vent. forma roseiflora Benke grows with typical V. stricta. A rather careful reconnaissance of the locale of the Wadmond collections failed to reveal any plants of the white-flowered form remaining in 1937."

The corollas are reported as "white" on Clinton s.n., Demaree 278888, Herb. Univ. Nebr. 364, Kellerman s.n., Over 14386, Seymour s.n., and Smyth 3061; as "pure white" on V. H. Chase 7852, A. Hayden 3001, and Schneck s.n.; as "nearly white" on Popenoe s.n. and Sheldon s.n.; and as "purplish-white" on Grace 363.

Steyermark (1963) records this form from Daviess, New Madrid, Ozark, Saint Louis, and Stone Counties, Missouri, on the basis of specimens preserved in the herbarium of the Missouri Botanical Garden at St. Louis, but not as yet seen by me.

In all, 54 herbarium specimens, including type material of most of the names involved, have been examined by me.

Citations: QUEBEC: Deux-Montagnes Co.: Cinq-Mars s.n. [31 juillet 1951] (Mg, Vi). ILLINOIS: Cass Co.: Seymour s.n. [Chandlerville, July 6, 1886] (Ur--30015). Henderson Co.: H. N. Patterson s.n. [Oquawka, August 1872] (N), s.n. [August 1873] (Al). LaSalle Co.: G. D. Fuller 1123 (Ur). Mason Co.: B. E. Clinton s.n. [Havana, June 21, 1894] (Ur); F. C. Gates 3608 (Ur). Sangamon Co.: Ahles 4592 (Ur); Winterringer 7333 (Il--36465). Tazewell Co.: V. H. Chase 7852 (Ur). Wabash Co.: Schneck s.n. [Mt. Carmel, July 1883] (Ur). Winnebago Co.: Wadmond s.n. [Roscoe, Aug. 16, 1931] (Ur). IOWA: Butler Co.: Isely 6508 (Gg--406216). Dickinson Co.: A. Hayden 3001 (Io--149002, N). Harrison Co.: V. L. Harms 601 (Lw). Story Co.: A. S. Hitchcock s.n. [Ames, July '82] (Io--15322). WISCONSIN: Crawford Co.: Terrell 2418 (Ws). LaCrosse Co.: Hartley 1499 (Ws). MINNESOTA: Hennepin Co.: F. H. Burglehaus s.n. [Aug. 1892] (Ob--50836). SOUTH DAKOTA: Roberts Co.: Over 14386 (W--1242264). KANSAS: Barber Co.: R. L. McGregor 14600 (Lw); J. D. Poindexter 201-68 (Lw). Comanche Co.: R. L. McGregor 14578 (Lw), *14679* (Lw). Decatur Co.: *V. L. Harms 1276* (Lw). Greenwood Co.: *J. Engleman 1079* (Ok). Marshall Co.: *W. H. Horr 4556* (Lw). Montgomery Co.: *R. L. McGregor 15052* (Lw). Osborne Co.: *Shear 149* (Ca--882822, W--227296). Republic Co.: *G. E. Morley 1302* (Lw). Riley Co.: *Kellerman s.n.* [Manhattan, 6-30-1887] (Ka). Shawnee Co.: E. A. Popenoe s.n. [Topeka, July 23, 1879] (Io--140912), *s. n.* [Topeka, July 24, '79] (W--1119632); *B. B. Smyth 3061* (Ka--79497). Washington Co.: *W. H. Horr 4622* (Lw). MISSOURI: Saint Clair Co.: *Steyermark 82192* (Lb--44931). ARKANSAS: Stone Co.: *Demaree 27888* (N), *278888* (Ok, St). NEBRASKA: Custer Co.: *Herb. Univ. Nebr. 364* (Au). Grant Co.: *Rydberg 1422*, in part [in the Lake Region of Grant County, 2 miles NE of Whitman, Central Nebraska, Aug. 1, 1893] (W--210364). Lancaster Co.: *J. L. Sheldon s.n.* [Lincoln, 8.11.98] (We). Nemaha Co.: *A. E. Allen s.n.* [Peru, Aug. 2, 1893] (Je). Thomas Co.: *Krautter s.n.* [Halsey, July 23, 1907] (Up--45722). Valley Co.: *Davidson, Dixit, & Romberg 4689*, in part (Au--122711). OKLAHOMA: Cherokee Co.: *C. S. Wallis 794* (St), *3395* (Au--122708, Au--122710, St). Logan Co.: *Grace 363* (Ok--19027). Marshall Co.: *Alder s.n.* [July 10, 1950] (Ok).

VERBENA STRICTA f. ROSEIFLORA Benke, Rhodora 34: 10. 1932.

Bibliography: Schaffner, Ohio Nat. 7: 31--34. 1906; Benke, Rhodora 34: 10. 1932; Perry, Ann. Mo. Bot. Gard. 20: 286, 287, & 356. 1933; Truman, Rhodora 40: 245. 1938; F. C. Gates, Fl. Kans. 191. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 6, 8, 9, & 102. 1942; Moldenke, Alph. List Cit. 1: 200 (1946), 2: 361 & 492 (1948), and 3: 827, 927, & 954. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 12, 15, 17, 19--21, & 199. 1949; M. L. Grant, Proc. Iowa Acad. Sci. 57: 118. 1950; Fern. in A. Gray, Man. Bot., ed. 8, 1211. 1950; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 129. 1952; Moldenke, Phytologia 4: 67 (1952) and 4: 185. 1953; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 2, 3: 129. 1958; Moldenke, Résumé 16, 19, 21, 22, 24, & 474. 1959; Moldenke, Résumé Suppl. 2: 2 & 3 (1960), 3: 7 (1962), and 4: 3. 1962; Steyerm., Fl. Mo. 1260. 1963; Moldenke, Résumé Suppl. 10: 1. 1964.

This form differs from the typical form of the species in having its corollas light-pink, pink, light-rose, rose-colored, rose-red, or roseate to lavender.

The plant is described as 2--3 feet tall. The type of the form was collected by Hermann Conrad Benke (*no. 5164*) at Concordia, Cloud County, Kansas, on July 24, 1929, and is deposited in the herbarium of the Chicago Natural History Museum. The collector says "High ridges and hills in long slopes rise from valleys far below in north central Kansas, each with its distinctive flora -- very luxuriant in the valley. About Concordia, among its most common plant life is *Verbena stricta* Vent., acres in extent. Hardly, however, is it to be classed as a weed, for it thrives only in limited areas and at limited times, certain soil conditions seeming to be necessary for its maintenance. The only area where the roseate-corolla form of this plant has been seen in my experience lies to the northwest of the city. Here, in a field of creek bottom some twenty acres in extent, was found an almost solid mass of the species in the usual purplish-blue, with lesser patches, here and there -- about a quarter part of all -- of the rose-colored form. This variation in color made a very charming impression in the landscape's features. With no intermediate colors to confuse....."

The form has been found along roadsides and open roadsides, in loam soil, dry or sandy loam, black loam and loam with fair soil moisture, on prairies, and along railroads, in grasslands, grassland pastures, severely overgrazed creek valley pastures, and ravines in prairie pastures, flowering and fruiting from June to September. Harms found it "scattered in large colony of the blue form" and "scarce in large colony of V. stricta" in Kansas, while Benke says that "in a field of some 20 acres about a quarter of the plants were of this color form" in the same state. Also in Kansas, McGregor reports "this form common with the species", while Horr says "a few specimens here" and "a large colony with the blue and white forms" and Morley encountered "one colony in overgrazed prairie pasture in loam soil not too far from small creek" (no. 464), "one or two plants found with very light corollas, thin loam over sandstone soil in grazed prairie pasture" (no. 376), and "one large plant of this very light color found" (no. 396).

Fernald & Pease emphasize that the "fresh" corollas were roseate. Schaffner (1906) describes a "pinkish-white" mutant which he found abundantly over acres of ground in Clay County, Kansas, along with the typical form or by itself. He notes that it is obviously a stable mutant. It is possible that he is referring here to f. albiflora Wadmond, but more probably to f. roseiflora Benke. Grant (1950) records it from Dickinson County, Iowa. C. L. Kucera, in a letter to me dated February 2, 1955, states that there are no specimens of this form in the University of Missouri herbarium and that he cannot recall ever having seen it in that state.

The flowers are described as "pink" on Horr 4660 and Spillman s.n.; as "light-pink" on Seymour s.n.; as "light-rose" on McGregor 15170; as "light-rose or pink" on Harms 1313; as "roseate" on Benke 5164 and Fernald & Pease 3496; as "lavender" on Porter 3413; and as "white and lavender" on Davidson, Dixit, & Romberg 4689 (probably a mixture with f. albiflora Wadmond).

Perry (1933) cites in addition Benke 5164 (G--isotype), not as yet seen by me.

In all, 24 herbarium specimens, including the type collection, have been examined by me.

Citations: ILLINOIS: LaSalle Co.: G. D. Fuller 2299a (Il-

15801). Marshall Co.: *V. H. Chase 11151* (Ur). McHenry Co.: *Benke 6150* (N). Sangamon Co.: *Seymour s.n.* [Springfield Junct., July 8, 1879] (Ur—17464). Vermilion Co.: *Ahles 8092* (Ur). MICHIGAN: Dickinson Co.: *Fernald & Pease 3496* (Mi). WISCONSIN: Rock Co.: *E. W. Fell 57-824* (Ws). KANSAS: Cloud Co.: *Benke 5164* (N—isotype, W—1515910—isotype). Jewell Co.: *W. H. Horr 4774* (Lw). Kiowa Co.: *R. L. McGregor 15170* (Lw). Morris Co.: *R. L. McGregor 4356* (Lw). Republic Co.: *G. E. Morley 376* (Lw), *396* (Lw), *464* (Lw), *794* (Lw). Russell Co.: *V. L. Harms 721* (Lw). Smith Co.: *V. L. Harms 1313* (Lw, N). Washington Co.: *W. H. Horr 4660* (Lw). MISSOURI: County undetermined: *Spillman s.n.* [s.w. Mo., Aug. '89] (Pl—22614). NEBRASKA: Valley Co.: *Davidson, Dixit, & Romberg 4689*, in part (Ur). WYOMING: Weston Co.: *C. L. Porter 3413* (Au). OKLAHOMA: Cherokee Co.: *C. S. Wallis 645* (St).

VERBENA STRIGOSA Cham., Linnaea 7: 256—257. 1832 [not *V. strigosa* Hook., 1836].

Bibliography: Cham., Linnaea 7: 256—257. 1832; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Pl. 3: 602. 1843; Walp., Repert. 4: 23. 1845; Schau. in A. DC., Prodr. 11: 540. 1847; Schau. in Mart., Fl. Bras. 9: 186. 1851; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Dusén, Arch. Mus. Nac. Rio Jan. 13: 36 & 94. 1903; Hayek, Denkschr. Kaiser. Akad. Wissensch. Math.-nat. 79 (1): 294. 1908; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 102. 1942; Moldenke, Alph. List Cit. 1: 289 (1946) and 2: 598 & 624. 1948; Moldenke, Castanea 13: 117. 1948; Moldenke, Alph. List Cit. 3: 688, 840, & 921—923 (1949) and 4: 1249. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 94 & 199. 1949; Stellfeld, Trib. Farmac. 19 (10): 167. 1951; Moldenke, Phytologia 4: 188. 1953; Rambo, Sellowia 7: 260 & 288. 1956; Angely, Fl. Paran. 7: 13. 1957; Reitz, Sellowia 11: 57 & 134. 1959; Moldenke, Résumé 111 & 474. 1959; Angely, Fl. Paran. 16: 79 (1960) and 17: 47. 1961; Moldenke, Phytologia 9: 289 & 292. 1963.

Small erect shrub, much branched, softly strigose-hirsute and incanous throughout, varying to subsericeous or very rarely almost glabrous; stems 30—45 cm. tall, as thick as the quill of a crow's feather at the base, simple at the base, much branched above, often deliquescent; branches tetragonal, with much smaller leaves or almost leafless above; leaves decussate-opposite, sessile or obscurely petiolate, the blades coriaceous to membranous, elliptic, varying from shorter than to as long as or even longer than the internodes, decreasing in size upwards, 8—12 mm. wide, more or less attenuate into the petiole at the base, obtusely crenate or acutely serrate with a few teeth toward the apex, entire and subcuneate at the base, 3-nerved at the base, the venation impressed above, prominulous beneath, the midrib usually pinnate above; inflorescence borne at the apex of the branches, single or ternate to quinate; spikes usually terminal, 4—20-flowered, mostly few-flowered, rather lax, solitary or densely cymose to racemose-paniculate on many axillary branchlets; bractlets broadly ovate, 1/4 to 1/3 as long as the calyx, concave, acute at the apex, ciliate; calyx membranous, about 4 mm. long, ampliate above, with herbaceous ribs, glabrous below and between the ribs, sparsely strigose on the angles above, short-ciliate, the teeth broadly triangular, very short, equal, apiculate at the apex; corolla pale-blue or blue to violet, rose, or red, clavate-cylindric, about 4.5 mm. long, lanuginous on the outside of the exserted portion, very densely barbate in the throat with very elegant moniliform exserted hairs, its limb medium-sized, the lobes cuneate, retuse at the apex; fruit about 2 mm. long; cocci ferruginous and striate on the back, rugose-areolate above, the commissural surface angular, rather broad, white-granular.

The type of this species was collected by Friedrich Sellow in São Paulo, Brazil, in or before 1832, and was deposited in the herbarium of the Botanisches Museum in Berlin, where it was photographed by Macbride as his type photograph no. 17448, but is now destroyed. Walpers (1845) places the species in his Section Verbenaca, Subsection Inermes, Group Foliosae, Subgroup Micranthae, and Secondary Subgroup Holophyllae with 22 other species. Schauer (1847) says "Praecedentis [V. hirta] formis parvifoliis quodammodo similis, sed jam calycis dentibus corollaeque barba magis conspicua discernenda. Variat foliorum figura et magnitudine neque minus indumento nunc sericeo nunc rarissimo ut planta fere glabra appareat". In his 1851 work he amplifies this to "V. hirtae formis parvifoliis primo obtitu persimilis, sed praeter alia calicis dentibus brevissimis latis apiculatis nec subulatis, corollaeque barba magis conspicua discernitur. Variat foliis basi magis minusve attenuatis, obtuse et acute serratis, neque minus indumento modo subsericeo modo rarissimo, ut planta fere glabra appareat."

It has been collected on campos, dry grassy campos, and rocky crests, in grassy places, shrubby fields, bogs, and pinewoods, from 750 to 2100 meters altitude, blooming in April, May, August, and October to February, fruiting in December. Rambo collected it in a region of 2 meters rainfall, rare snows, and 0--24 degrees temperatures. Dusén (1903) says that it grows "In silvula ad marginem viae" and "in silva primaeva ad marginem viae" in São Paulo. Common names recorded for it are "camaradinha", "formosa sem dote", and "jurupeba", names apparently applied to almost all the species of the genus in southern Brazil. The V. strigosa of Hooker is V. rutha Lehm. The Dusén 313, distributed as V. strigosa, is actually V. lobata Vell. Rambo 49319 is said to have had blue flowers, and Hatschbach 4216 had violet ones.

Schauer (1847) cites Riedel s.n. and Sellow s.n. from São Paulo in the Leningrad and Berlin herbaria, while Hayek (1908) cites Wacket s.n. and Wettstein & Schiffner s.n. from the same state.

In all, 30 herbarium specimens, including the type collection, and 9 mounted photographs have been examined by me.

Citations: BRAZIL: Paraná: Dusén 7969 (S); Hatschbach 4216 (Ok), *4217* (Ok); *Herb. Mus. Nac. Rio Jan. 46595* (Ja); *Jönsson 1209a* (S, W--1481970); *M. Kuhlmann s.n.* [Villa Velha, Aug. 28, 1939] (N, Sp-41551); *Rambo 36421* (N). Rio Grande do Sul: *Rambo 30981* (N), *32450* (N), *34728* (S), *49319* (S); *Sehnem 5155* (B). Santa Catarina: *Reitz 3280* (N), *3404* (S), *3417* (N); *Smith & Klein 8101* (Ok, W--2251344), 11107 (W--2251751, Z); *Smith & Reitz 9994* (W--2249364), *10024* (Ok, W--2251638), *10163* (W--2249366). São Paulo: *Herter 4360* (N); *Sellow 4939* (Vt), *s.n.* [Brasilia; Macbride photos 17448] (Br--isotype, F--photo of isotype, Kr--photo of isotype, N--photo of isotype, N--isotype, N--photo of type, N--photo of isotype, N--photo of type, Si--photo of isotype, Vt--isotype, Z--photo of type, Z--photo of isotype).

VERBENA SUBPALUDOSA Malme ex Angely, Fl. Paran. 17: 47, nom. nud. 1961.

Bibliography: Angely, Fl. Paran. 17: 47. 1961; Moldenke, Résumé Suppl. 7: 5. 1963.

Nothing whatever is known to me about this species except that it is recorded by Angely from Paraná, Brazil. I cannot find that Malme ever published the name.

VERBENA SUBULIGERA Greene, Pittonia 1: 156. 1888.

Synonymy: *Verbena subligera* Greene ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102, sphalm. 1942.

Bibliography: Greene, Pittonia 1: 156. 1888; Durand & Jacks., Ind. Kew. Suppl. 1: 451.1906; Perry, Ann. Mo. Bot. Gard. 20: 249, 250, 262, 303--304, & 356. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 19 & 102 (1942) and [ed. 2], 33 & 199. 1949; Moldenke, Alph. List Cit. 4: 1292. 1949; Moldenke, Résumé 40 & 474. 1959; Moldenke, Résumé Suppl. 2: 4, 13, & 15. 1960; Moldenke, Phytologia 9: 195 (1963) and 10: 140. 1964.

Stems probably several from a common base, procumbent, hirsute-pubescent; leaves decussate-opposite, the blades ovate, 1.5--4 cm. long, gradually narrowed into a subpetiolar base, pinnately cleft, appressed-hirsute on both surfaces, especially beneath on the somewhat prominently reticulate venation, the larger segments incised or sharply dentate; spikes short-pedunculate, elongate, conspicuously bracteate, interrupted in fruit; bractlets lanceolate-subulate, twice as long as the calyx, ascending-spreading, reflexed in age, hirsute; corolla-tube scarcely longer than the calyx; fruiting-calyx about 3 mm. long, pubescent, hirsute on the venation, the lobes very short, strongly connivent over the schizocarp; cocci subcylindric-trigonous, about 2 mm. long, only faintly striate, the commissural surface muriculate or smoothish, not reaching the top of the nutlet.

The type of this little-known endemic species was collected by A. Forrer in the Sierra Madre west of Durango, Durango, Mexico, at an altitude of 8100 feet, in September or October, 1881. The species has been found in pinewoods and on pine-covered mountains and mountaintops, at altitudes of 2400 to 2700 meters, flowering and fruiting from August to October. Material has been misidentified and distributed in herbaria as V. bracteata Lag. & Rodr.

Perry (1933) cites the following 3 additional specimens not as yet seen by me: MEXICO: Durango: Forrer s.n. [Sierra Madre, September and October 1881] (D--isotype, F--isotype, G--isotype). The isotype which she cites from "NY" is actually in the Columbia University herbarium. She notes that "Although the general habit of this species is much like that of V. bracteata, the latter differs in having obtusish leaf-segments and sharply reticulate-striate nutlets with commissural faces fully as long as the nutlet."

In all, 9 herbarium specimens, including type material of all the names involved, have been examined by me.

Citations: MEXICO: Durango: Forrer s.n. [Sierra Madre, September and October 1881] (C--isotype, Ca--170277--isotype, I--isotype, I--isotype, W--1465960--isotype, W--1465961--isotype); Waterfall 12703 (Mi, St), 15504 (St).

xVERBENA SUKSDORFI Moldenke, Phytologia 2: 150--151. 1946.

Synonymy: Verbena officinalis x prostrata Dermen, Cytologia 7: 170. 1936. Verbena suksdorfii Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212, sphalm. 1951. Verbena lasiostachys var. septentrionalis Moldenke x V. officinalis L. ex Moldenke, Résumé 368, in syn. 1959. Verbena officinalis L. x V. lasiostachys var. septentrionalis Moldenke, Résumé 371, in syn. 1959.

Bibliography: Dermen, Cytologia 7: 170. 1936; Moldenke, Phytologia 2: 150--151. 1946; H. N. & A. L. Moldenke, Pl. Life 2: 84. 1948; Moldenke, Alph. List Cit. 2: 495 (1948) and 4: 981. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 164 & 199. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Am. Midl. Nat. 59: 361--362. 1958; Moldenke, Résumé 224, 368, 371, 421, & 474. 1959; Moldenke, Phytologia 8: 121. 1961; Moldenke, Résumé Suppl. 3: 41. 1962; Moldenke, Phytologia 10: 210 & 211. 1964.

Tall herb, apparently a natural or artificial hybrid between V. officinalis L. and V. lasiostachys var. septentrionalis Moldenke, with intermediate characters; stems rather stout, obtusely tetragonal below, sharply angled above, light-colored, rather abundantly short-pubescent toward the base with stiff whitish often bulbous-based hairs less than 1 mm. long, less densely so toward the apex and on the branches, peduncles, and rachis, but sufficiently abundant throughout to impart a very rough and harsh feel to these organs especially when the finger is moved downwards, the uppermost portions of the stem with margined angles, the stems, branches, and peduncles also very densely fine-puberulent with microscopic (almost punctiform) hairs, the rachis more conspicuously puberulent with longer whitish forward-pointing hairs; principal internodes mostly elongate, 3--8 cm. long; leaves decussate-opposite, usually with clusters of smaller ones on greatly abbreviated branches in their axils; nodes plainly annulate; petioles 1—2 cm. long, broadly winged and not plainly distinguishable from the blades into which they grade: leaf-blades rather thick and firm, very harsh to touch on both surfaces, very brittle in drying, to about 9 cm. long, varying from deeply 3-fid to undivided and merely laciniate-incised along the margins, ovate in outline, the two basal lobes on the largest leaves usually widespreading, giving the blade a width of 5.5 cm. at the base, incised-laciniate, the margins more or less revolute, more or less densely short-pubescent on both surfaces with stiff forward-pointing bulbous-based hairs, more densely and lastingly so on the venation beneath; inflorescence copiously branched at the apex of the stem; spikes greatly elongate, usually 15—40 cm. long, densely many-flowered, but apparently not setting fruit; peduncles mostly abbreviated, acutely tetragonal, margined; bractlets ovate, about 2 mm. long, 0.5—1 mm. wide at the base, ciliate-margined to the apex, puberulent on the back, acuminate, keeled; calyx slightly longer than the subtending bractlet, about 3 mm. long, whitish-strigose; corolla-tube equaling the calyx, its limb about 2 mm. wide.

The type of this remarkable plant was collected by Wilhelm Nikolaus Suksdorf — in whose honor it is named -- in a garden at Bingen, Klickitat County, Washington, on November 21, 1904, and is deposited in the herbarium of the State College of Washington at Pullman. The plant seems definitely to be a hybrid because the greatly elongated spikes in the only three specimens seen contain hundreds of mature calyxes, but not a single fruit. The other described natural hybrids in this genus are also noteworthy for the paucity in fruiting, but none has the lack of fruit so complete as in this one. The same hybrid has apparently been produced artificially by Dermen and is referred to by him as V. officinalis x prostrata. The source of Suksdorf's plant is not known, and neither parent is known from the wild in Washington. It may be distinguished from V. officinalis in having its spikes much elongate, 6—16 inches long and densely flowered, the flowers subimbricate, the leaves mostly trifid, the calyx about 3 mm. long, and by the fact that it sets hardly any fruit. From V. lasiostachys and its varieties it may be distinguished by the fact that the spikes are merely strigillose or puberulent and do not set fruit well, if at all.

In all, 3 herbarium specimens, including type material of most of the names involved, a 2 mounted photographs have been examined by me.

Citations: CULTIVATED: Washington: Suksdorf s.n. [Sept. 25, 1904] (Pl—138360), s.n. [Nov. 21, 1904] (N—isotype, N—photo of type, Pl—138361—type, Z—photo of type).

VERBENA SULPHUREA D. Don in Sweet, Brit. Flow. Gard., ser. 2, 3: pl. 221. 1834.

Synonymy: Shuttleworthia diceras Meisn., Pl. Vasc. Gen. 2: 198.

1839. Shuttleworthia sulphurea Meisn., Pl. Vasc. Gen. 2: 198. 1839. Uwarowia chrysanthemifolia Bunge, Bull. Sci. Acad. Pétersb. 7: 278. 1840. Shuttelworthia diceras Meisn. ex Steud., Nom. Bot., ed. 2, 2: 575 & 750. 1841. Shuttelworthia sulphurea Meisn. ex Steud., Nom. Bot., ed. 2, 2: 575 & 750. 1841. Verbena diceras Bert. ex Steud., Nom. Bot., ed. 2, 2: 750, in syn. 1841. Schuttleworthia dissecta Walp. apud Schau. in A. DC., Prodr. 11: 551, in syn. [as "Schuttlew."]. 1847. Uwarowia sulphurea Bunge apud Schau. in A. DC., Prodr. 11: 551, in syn. 1847. Verbena dissecta Poepp. ex Schau. in A. DC., Prodr. 11: 551, in syn. 1847 [not V. dissecta Morong, 1904, nor Schau., 1959, nor Willd., 1825]. Verbena sulfurea Sweet apud Schau. in A. DC., Prodr. 11: 551. 1847. Verbena sulphurea Sweet apud C. Gay, Hist. Fis. Chile Bot. 5: 8. 1849. Schuttleworthia sulfurea Meisn. apud C. Gay, Hist. Fis. Chile Bot. 5: 8, in syn. 1849. Uwarowia sulphurea Schau. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1161, in syn. 1895. Verbena sulfurea α normalis Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898. Verbena sulfurea D. Don apud Solered., Bull. Herb. Boiss., sér. 1, 6: 627. 1898. Shuttleworthia dissecta Walp. apud Reiche, Fl. Chile 5: 289, in syn. 1910. Shuttleworthia sulfurea Meisn. apud Reiche, Fl. Chile 5: 289, in syn. 1910. Glandularia sulphurea (D. Don) Schnack & Covas, Darwiniana 6: 475. 1944. Glandularia sulfurea Schnack & Covas, Darwiniana 7: 72. 1945. Verbena sulfurea Sw. ex Moldenke, Résumé 376, in syn. 1959. Verbena dissecta Walp. ex Moldenke, Résumé Suppl. 3: 37, in syn. 1962. Verbena lobata Meisn. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963 [not V. lobata Arrab., 1841, nor Vell., 1825].

Bibliography: Sweet, Brit. Flow. Gard. 6 [ser. 2, 3]: pl. 221. 1834; Lindl. in Edwards, Bot. Reg. 21: pl. 1748 & 1766. 1835; Meisn., Pl. Vasc. Gen. 2: 198. 1839; G. Don in Loud., Hort. Brit. Suppl. 2: 680. 1839; Bunge, Bull. Sci. Acad. Pétersb. 7: 278. 1840; Fisch. & Mey., Mém. Acad. St. Pétersb., ser. 6, 6 (2): 153—156. 1840; Steud., Nom. Bot., ed. 2, 2: 575 & 750. 1841; Walp., Nova Act. Acad. Nat. Caes. Leopold.-Carol. Cur. 19: Suppl. 1: 379. 1843; D. Dietr., Syn. Pl. 3: 605. 1843; Walp., Repert. 4: 12. 1845; Schau. in A. DC., Prodr. 11: 551. 1847; C. Gay, Hist. Fis. Chile Bot. 5: 8—10. 1849; R. A. Phil., Fl. Atac. 40. 1860; R. A. Phil., Viaje Des. Atac. 20, 25, & 214. 1860; Bocq., Adansonia 2: 126, pl. 11. 1861—1862; Bocq., Rév. Verbénac. 46. 1862; R. A. Phil., Anal. Univ. Chile 35: 190. 1870; Lorentz & Niederlein, Exped. Rio Negro 2 (bot.): 255. 1881; F. Phil., Cat. Pl. Vasc. Chil. 221. 1881; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147 & 148, fig. 57E. 1894; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 895, 1161, 1178, & 1179. 1895; Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898; Solered., Bull. Herb. Boiss., sér. 1, 6: 627. 1898; Macloskie in W. B. Scott, Rep. Princeton Univ. Exped. Patag. 8 (2): 688. 1905; Briq., Ann. Conserv. & Jard. Bot. Genèv. 10: 104. 1907;

Reiche, Fl. Chile 5: 273 & 289—290. 1910; Hauman-Merck, Anal. Mus. Argent. Hist. Nat. Buenos Aires 24: 414. 1913; Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 97, 98, 124, 127, 128, & 134. 1919; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2239. 1927; I. M. Johnst., Contrib. Gray Herb. 85: 100—101. 1929; Stapf, Ind. Lond. 6: 403 & 431. 1931; Moldenke, Suppl. List Invalid Names 8 & 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42, 74, & 102. 1942; Moldenke, Alph. List Invalid Names 46 & 51. 1942; Raimondi, Bol. Mus. Hist. Nat. Jav. Prado 7: 244. 1943; Moldenke, Lilloa 10: 345. 1944; Schnack & Covas, Darwiniana 6: 471, 473, & 475 (1944) and 7: 72. 1945; Cabrera, Bol. Soc. Argent. Bot. 1: 67. 1945; Indic. Taxonom. 1 (14—16): 6. 1945; Moldenke, Alph. List Cit. 1: 39, 221, & 356. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 10 & 20. 1947; Moldenke, Alph. List Cit. 2: 411, 560, 561, 671, 672, 749, 750, 811, 872, & 940 (1948) and 4: 1115, 1175, 1187, 1191, 1209, 1215, 1233, & 1302. 1949; Moldenke, Known Geograph. Distrib. Verbenac., [ed. 2], 102, 164, & 199. 1949; C. Skottsberg, Medd. Göt. Bot. Trädg. 18: 151. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 65—66. 1951; Moldenke, Inform. Mold. Set 46 Spec. 4. 1951; Moldenke, Phytologia 3: 468. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 101. 1953; Moldenke, Phytologia 5: 96. 1954; Moldenke, Inform. Mold. Set 48 Spec. [4] (1954), 49 Spec. 3 (1954), and 51 Spec. 4. 1956; Muñoz Pizarro, Sin. Fl. Chil. 199, pl. 96 c—e. 1959; Moldenke, Résumé 122, 224, 296, 344, 355, 363, 376, & 474. 1959; Moldenke, Résumé Suppl. 2: 10 & 11 (1960) and 3: 15, 35, & 37. 1962; Moldenke, Phytologia 8: 192 & 204 (1962), 8: 461 (1963), and 9: 67, 70, 72, 117, 130, & 192. 1963; Moldenke, Résumé Suppl. 6: 11 (1963) and 7: 8 & 10. 1963; Moldenke, Phytologia 9: 397 (1964), 10: 299 (1964), and 11: 21 & 62. 1964.

Illustrations: Sweet, Brit. Flow. Gard. 6 [ser. 2, 3]: pl. 221 [in color]. 1834; Lindl. in Edwards, Bot. Reg. 21: pl. 1748 [in color]. 1835; Fisch. & Mey., Mém. Acad. St. Pétersb., ser. 6, 6 (2): 156 [in color]. 1840; Bocq., Rév. Verbénac. pl. 11. 1862; Briq. in Engl. & Prantl, Nat. Pflanzenfam. 4 (3a): 147, fig. 57E. 1894; Sanzin, Anal. Soc. Cientif. Argent. Buenos Aires 88: 128. 1919; Muñoz Pizarro, Sin. Fl. Chil. pl. 96 c—e. 1959.

Robust hairy perennial herb or suffruticose, green or cinereous, 20—60 cm. tall, the pubescence often villous or hispid and ashy-gray; stems variable, procumbent or creeping, herbaceous or sometimes slightly woody at the base, spreading or ascending, branched; branches ascending or erect, tetragonal, hirsutulous, leafless and merging into the peduncle at the apex; leaves decussate-opposite, usually with many small ones fascicled in their axils, multipartite to tripartite, pinnatifid or subbipinnatifid, entire at the petiolar base, 1.5—3 cm. long, strigose-hispidulous on both surfaces, the lower ones remote, the segments all narrow or linear, rather uniform, simple and entire or trifid, obtuse at the apex, wide-spreading, subrevolute or revolute along the margins; inflorescence capitate-globose, usually not elongating after anthesis, pedunculate; heads many-flowered; peduncles short or elongated, leafless;

bractlets subulate or lanceolate, 3--6.5 mm. long, acuminate at the apex, varying from one-third as long to almost equaling the calyx, canescent-hirsute; calyx clavate-tubular or narrow-cylindric, 6--8 (--12) mm. long, plicately 5-angled, canescent-hirsutulous, the 5 teeth short, unequal, 0.5--1.5 mm. long, acute at the apex; corolla hypocrateriform, rather large, varying from yellow, pale-yellow, or lemon-yellow to pale sulphur-yellow or cream-yellow, its tube usually 9--10 mm. long, glabrous on the outside, glabrous or sparsely pilose within with moniliform hairs below and awl-shaped retrorse more dense hairs toward the apex, the limb 5-parted, about 8 mm. wide, barbate in the throat and at the mouth, the lobes cuneate, 3--3.5 mm. long, 2.5--3.2 mm. wide, deeply retuse at the apex; anther-appendages varying from violet or dark-violet to chocolate-brown or black, large, clavate, 1.2--1.3 mm. long, long-exserted from the corolla-throat, recurved; style about 7.5 mm. long; cocci 4 or by abortion only 3 or 2, reticulate-rugose on the back, about half as long as the fruiting-calyx; chromosome number: 2n = 10.

This is apparently a very variable species or else several taxa are herein included. It has been collected in sandy soil on sandy flats, dry sandy hills and slopes, low hills and arid sandy hillsides, dunes, and huge sand-dunes by the sea, at altitudes from sea-level to 400 meters, flowering from August to December, fruiting in October. Morrison says of it "not common on low hills in sandy soil just back from the ocean". A common name is "sulphur verbena". The plant has been in cultivation since 1832 in England, 1841 in Switzerland, 1843 in Italy, and 1848 in Belgium. Reiche notes that it is a very ornamental plant, occurring naturally from Atacama to the Araucaria zone in Chile, both on the coast and in the mountains, and that it also occurs in Peru. Schauer (1847) actually cites a Meyen s.n. from "in Peruvia ad Chuquito", while Raimondi (1943) cites his no. 9324 from Junin, Peru, and no. 10562 from Huánuco, Peru, but of the latter he says "Flores de color morado claro". Walpers (1845) also cites the species from Peru ["Chuquito" — apparently Meyen's collection]. I have not as yet seen any material of V. sulphurea from Peru, and in view of Raimondi's statement about the color of the flowers, I suspect that the Peruvian records may be based on misidentifications.

I. M. Johnston (1929) asserts that the "Verbena sulphurea" and "V. erinoides" of Philippi, Fl. Atac. 40 and Viaje Des. Atac. 20, 25, & 214 (1860) are actually V. atacamensis Reiche. Skottsberg & Skottsberg 843 was first identified as V. porrigens R. A. Phil., then as V. berterii Schau. and so cited by me in Lilloa 10: 345 (1944), but seems to be V. sulphurea instead.

Shuttleworthia diceras was based on nos. 1392 and 1809, collected by Carlo Giuseppe Bertero at Valparaiso, Chile, in October, 1819; V. lobata Meisn. is based on Miers 335, also from Valparaiso, deposited in the herbarium of the British Museum in London. The

Verbena dissecta of Morong is actually V. tenuisecta Briq., that of Schauer is V. berterii (Meisn.) Schau., and that of Willdenow is a valid species. The Lorentz & Niederlein reference given in the bibliography is sometimes erroneously dated "1889". The Loudon reference (1839) is sometimes accredited to W. Baxter, apparently in error.

Material of V. sulphurea has been misidentified and distributed in herbaria under the names V. berterii Schau., V. dissecta Spreng., V. erinoides Hook., V. erinoides Lam., V. multifida Ruíz & Pav., V. porrigens R. A. Phil., and Shuttleworthia dissecta Walp. On the other hand, the Skottsberg & Skottsberg 739, distributed as V. sulphurea, is the type collection of f. alba Moldenke, and 885 is the type collection of var. fuscorubra Skottsberg. Claude-Joseph 3547 is a mixture with var. taltalensis Moldenke, and Miers s.n. [Concan] is a mixture with V. berterii.

Verbena sulphurea apparently is very variable, is a mixture of several unrecognized taxa, or else the published descriptions are in part based on misidentifications. Skottsberg (1950) sums up the matter as follows: "El tubo corolar fué descrito como 'perfectly glabrous, both within and without'; de Candolle (Prodr. XI p. 551) dice 'corolla glabra', Gay (V p. 9) 'tubo glabro en el esterior', Reiche (V p. 290) 'tubo corolar pelado'. La figura 3 de Sweet muestra un tubo hirsuto por dentro como en nuestras plantas. Los pelos son de dos clases, moniliformes, esparcidos por el tubo más numerosos por arriba, y agujitas retrorsas y muy tupidas en la garganta (en este respecto la figura de Sweet es inexacta). Las indicaciones sobre el tamaño de los órganos florales varían bastante; en la ilustración citada la bráctea mide 7 mm, el cáliz 9.5, con dientes largamente mucronados, las divisiones mayores del limbo corolar 4 x 3 y los apéndices de los estambres superiores 1.5 mm. En la lámina de Lindley (Bot. Register XXI tab. 1148) las flores son algo mayores que en nuestra variedad fuscorubra. Gay indica un cáliz de 6—8 mm, 'un tanto mas largo que la brácteas', y la corola 'casi el doble más larga que el caliz'; según Reiche el cáliz mide 10—12 mm, las brácteas 3—4 mm ('un tercio del largo del cáliz'), y el tubo corolar 18--20 mm; según de Candolle el cáliz mide 7 y la corola 10—11 ('calycem dimidio superans')."

Goodspeed describes the "stamens" as black, but probably is referring to the anther-appendages only. Schauer (1847) says "Variat indumento magis minusve hirsuto hispidove, canescens et viridis." The canescent form is probably what Philippi refers to in his var. canescens, which see. Reiche speaks of the inflorescences becoming cylindric in age; possibly he refers here to what is now known as var. taltalensis Moldenke.

Schauer (1847) cites Bertero 1392 & 1809, Poeppig 157, Cuming 519, Gaudich s.n., Gay s.n., and Bridges s.n. from "In Chili arenosis sterilibus maritimis, ad Quintero et Valparaso, Concon, cet" as well as the Meyen s.n. from Peru. mentioned above, all deposited in the Berlin and De Candolle herbaria, the former now destroyed. Hauman-Merck (1913) cites a Garbers s.n. [Hauman-Merck 348] from the plateau near Choele-Choel and Hier-Berg 124 from near Carmen de Patagones and San Blas, Río Negro, Argentina.

In all, 96 herbarium specimens, including type material of some of the names involved, and 3 mounted photographs have been examined by me.

Citations: CHILE: Aconcagua: Barros Valenzuela 8034 (N); Claude-Joseph 2516 (W—1189235); E. M. Kausel 2590 (N); Looser 5499 (N), 5503 (N); Rose & Rose 19395 (N, W—761925). Atacama: Morong 46 (C), 1126 (C), 1287 (C). Coquimbo: Barros Valenzuela 8037 (N); W. H. Harvey s.n. [Coquimbo, July—August 1856] (S); Looser 4217 (N), 4218 (N); Skottsberg & Skottsberg 789 (N), 843 (Go, N, S); Sparre 2680 (S). Malleco: Kunkel 166 (Cb). Santiago: Böcher, Hjerting, & Rahn 602 (S); Claude-Joseph 1725, in part (W—1121280). Valparaíso: K. Behn s.n. [29-VIII-1937] (N); Bertero 1392 (Du—166497, M, N—photo, S, Si—photo, Z—photo), 1809 (M), s.n. [Valparaiso] (Br); Bridges s.n. [Valparaiso] (Bm, Br, Br); Buchtien s.n. [Viña, 21/9/95] (S, W—1177976); Claude-Joseph 3547, in part (W—1281540), 3770 (W—1281647), 4991 (W—1422114); Collector undesignated 275 [314] (Mh); Garaventa 2438 [Herb. Looser 2024] (N); Goodspeed 4586 (Ca—561316); Looser 2084 (N, N), 3997 (N, N), 4024 (N); Miers 72x (W—1343927), 335 (Bm), s.n. [Concan] (Bm); Moldenke & Moldenke 19762 (Es, Lg, Mg, N, Ot, Sm), 19770 (B, Es, F, Fy, Hk, Hw, Le, Lg, Lm, Mg, Mr, N, No, Ok, Ot, Rs, S, Sm, Sm, Ss, Ss, Z); Morong 1332 (C); J. L. Morrison 16846 (Ca—629959, S); R. A. Philippi 1299 (W—1323131); Rose & Rose 19146 (N, W—761710); Wall & Sparre 5 (Ew); Werdermann 17 (Ca—238179, Gg—34515, S). Province undetermined: Bridges s.n. [Chile] (S); Claude-Joseph 2177 [Costa] (W—1189516); Cuming 450 (Br), s.n. [Chile, 1835] (Br); Herb. Sullivant s.n. [Chili] (Pa); Miers 511 [south of Chile] (Bm), 512 [south of Chile] (Bm); Petré s.n. (S). CULTIVATED: Belgium: M. Martens s.n. [h. b. Brux. 1848] (Br). Italy: Herb. Harvey s.n. [hort. Aurelian, 1843] (Du—166496). Switzerland: Herb. Hort. Basil. s.n. [Aug. 1841] (M).

VERBENA SULPHUREA f. ALBA Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199, nom. nud. 1949; ex C. Skottsberg, Medd. Göt. Bot. Trädg. 18: 151. 1950.

Bibliography: Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. 1949; Moldenke, Alph. List Cit. 3: 940. 1949; C. Skottsberg, Medd. Göt. Bot. Trädg. 18: 151. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 66. 1951; Moldenke, Résumé 122 & 474. 1959.

This form differs from the typical form of the species in having its corollas white or greenish-white. It is described as a perennial herb, 10—15 cm. tall, with leaves pubescent, bractlets 4—5 mm. long, flowers very fragrant, calyx 8—8.5 mm. long, corolla-tube 10—11 mm. long, the lobes of its limb 4 mm. long and 3 mm. wide, anther-appendages black, about 2 mm. long, and style 10 mm. long.

The type of this form was collected by Carl Johan Frederik Skottsberg and Inga Skottsberg (no. 739) at Estancia Frai Jorge, at an altitude of 215 meters, Coquimbo, Chile, on August 13 or 14, 1917, and is deposited in the herbarium of the Botaniska Trädgarden at Göteborg. Worth & Morrison describe the "stamens" as black, but I assume that they are here referring to the anther-appendages only. The form has been found growing on steep brushy rocky slopes at altitudes of 215 to 1800 meters, flowering in August and November. Material has been distributed in herbaria under the designation "Verbena sulphurea Sweet".

In all, 4 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: CHILE: Coquimbo: Skottsberg & Skottsberg 739 (Go—type, N—isotype, N—photo of type, S—isotype, Z—photo of type); Worth & Morrison 16690 (Ca—633190).

VERBENA SULPHUREA var. CANESCENS R. A. Phil., Anal. Univ. Chil. 35: 190, in nota. 1870.

Bibliography: R. A. Phil., Anal. Univ. Chil. 35: 190. 1870; Moldenke, Résumé Suppl. 7: 5. 1963.

Nothing is known to me about this variety except that Philippi (1870) says "Se recojió una variedad 'canescens' de esta especie [Verbena sulphurea Sweet], que es una de las pocas que habitan en ambos lados de la cordillera." I assume that the name applies to the ashy-gray form of V. sulphurea referred to by me (above). More study is needed to determine if the gray and canescent forms of the species are worthy of nomenclatural separation.

VERBENA SULPHUREA var. FUSCORUBRA Skottsberg ex Moldenke, Alph. List Cit. 3: 940, hyponym. 1949; Medd. Göt. Bot. Trädg. 18: 151. 1950.

Bibliography: Moldenke, Alph. List Cit. 3: 940. Feb. 10. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. Sept. 28. 1949; C. Skottsberg, Medd. Göt. Bot. Trädg. 18: 151. 1950; Moldenke, Phytologia 3: 290. 1950; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 66. 1951; Moldenke, Résumé 122 & 474. 1959.

This variety differs from the typical form of the species in having dark-red corollas. Skottsberg states that it also differs from (his concept of) the typical form of the species in being more robust and less hirsute, in having the bractlets 6—7 mm. long, and in having larger flowers, the calyx 10 mm. long, its teeth 1.5—2.5 mm. long, subulate, the corolla-tube 11—14 mm. long, the lobes of the limb 5.5 mm. long and 3.5 mm. wide, the anther-appendages gray, 2—2.5 mm. long, and the style 10 mm. long.

The type of the variety was collected by Carl Johan Frederik

Skottsberg and Inga Skottsberg (no. 885) at Loma de Frai Jorge, Coquimbo, Chile, on August 19 ["August 19" according to the label, but September 19, according to the original description], 1917, and is deposited in the herbarium of the Botaniska Trädgard at Göteborg. It was originally identified as and distributed as "Verbena sulphurea Sweet". It has been found in anthesis from August to October.

In all, 3 herbarium specimens, including the type, and 2 mounted photographs have been examined by me.

Citations: CHILE: Coquimbo: Skottsberg & Skottsberg 885 (Go--type, N--photo of type, S--isotype, Z--photo of type). Ovalle: Barros Valenzuela 8031 (N).

VERBENA SULPHUREA var. INTERMEDIA Kuntze, Rev. Gen. Pl. 3 (2): 258 [as "sulfurea"]. 1898.

Synonymy: Verbena sulfurea f. intermedia Kuntze ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena sulphurea f. intermedia Kuntze ex Moldenke, Suppl. List Invalid Names 10. 1941. Verbena sulphurea intermedia Kuntze ex Moldenke, Résumé 376, in syn. 1959.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898; Macloskie in W. B. Scott, Rep. Princeton Univ. Exped. Patag. 8 (2): 689. 1905; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42, 44, & 102. 1942; Moldenke, Alph. List Cit. 1: 93 (1946), 2: 446 (1948), and 3: 748. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102, 107, & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 67. 1951; Moldenke, Résumé 122, 128, 376, & 474. 1959; Moldenke, Résumé Suppl. 7: 10. 1963; Moldenke, Phytologia 9: 397 (1964) and 11: 52. 1964.

This variety differs from the typical form of the species in having the corolla-tube to 15 mm. long, twice the length of the calyx.

The type of the variety was collected by Francisco Josué Pascasio Moreno and Tonini (no. 330) in Patagonia and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has been collected along roadsides and in quebradas, at altitudes of 1800 to 3200 meters, in anthesis from December to April and in October. Material has been misidentified and distributed in herbaria under the names V. laciniata (L.) Briq. and V. radicans Gill.

The plant is described as an herb with white flowers [Cuezzo & Barkley 20Mz538; Ruíz Leal 1284] or white, purple in the throat [Cuezzo & Barkley 20Mz378]. Kuntze says "Tubus corollae calyce duplo longior -- 1 1/2 cm longus.....Bei α normalis ist der Corollen-tubus kaum 1 cm. lang und überragt der Kelch nur wenig."

In all, 16 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: CHILE: Coquimbo: Herb. Mus. Nac. Santiago 12 (N).

ARGENTINA: Mendoza: Carette 339 (N); Cuezzo & Barkley 20Mz378 (N), 20Mz538 (N); Ruíz Leal 1284 (N), 3627 (N), 5130 (N), 7200 (Rl), 10697 (Z); Semper s.n. [Herb. Ruíz Leal 3419] (N), s.n. [Herb. Ruíz Leal 4258] (N), s.n. [Herb. Ruíz Leal 10563] (Rl), s.n. [Herb. Ruíz Leal 13078] (Rl). San Juan: Castellanos 15923 (W—2198348); F. A. Roig s.n. [Herb. Ruíz Leal 12995] (Rl); Semper s. n. [Herb. Ruíz Leal 13966] (Rl). Province undetermined: Moreno & Tonini 330 [Patagonia] (N—type).

VERBENA SULPHUREA var. LONGITUBA Kuntze, Rev. Gen. Pl. 3 (2): 258 [as "sulfurea"]. 1898.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 42 & 102. 1942; Moldenke, Castanea 13: 118. 1948; Moldenke, Alph. List Cit. 2: 444 & 628 (1948) and 3: 672. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 70. 1951; Moldenke, Résumé 122 & 474. 1959; Moldenke, Résumé Suppl. 7: 5 & 10. 1963.

This variety differs from the typical form of the species in its elongate corollas, which are to 20 mm. long, almost 3 times the length of the calyx.

The type of this variety was collected by Carl Ernst Otto Kuntze at Paso Cruz, at an altitude of 2400 meters, O'Higgins, Chile, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has also been found at 1000 meters altitude, flowering in October. The Stockholm specimen cited below shows very curious pubescence on the calyx. Material has been identified and distributed in herbaria as V. sulphurea D. Don.

In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: CHILE: Aconcagua: Herb. Mus. Bot. Stockholm s.n. (S). Coquimbo: Looser 4216 (N). O'Higgins: Kuntze s.n. [Paso Cruz, 2400 m.] (N—type).

VERBENA SULPHUREA var. PEDUNCULATA C. Gay, Hist. Fis. Chile Bot. 5: 8. 1849.

Bibliography: C. Gay, Hist. Fis. Chile Bot. 5: 8. 1849; Reiche, Fl. Chile 5: 290. 1910; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 102 & 199. 1949; Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 67. 1951; Moldenke, Résumé 122 & 474. 1959.

This variety differs from the typical form of the species in having its leaves larger, with more remote segments, and the peduncles longer, almost leafless, and nutant.

No type was designated for this variety by Gay, and I know nothing about it except what is said by him in his original Latin diagnosis. His Spanish description is apparently meant to include both the variety and the typical form of the species, of which he says "Planta algo comun en las provincias centrales y del norte Valparaiso, Quintero, Coquimbo, etc."

VERBENA SULPHUREA var. **SCABRA** Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 67—68. 1951.

Bibliography: Acevedo de Vargas, Bol. Mus. Nac. Hist. Nat. Chile 25: 67—68. 1951; Biol. Abstr. 28: 904. 1954; Moldenke, Phytologia 5: 96. 1954; Moldenke, Résumé 122 & 474. 1959; Moldenke, Résumé Suppl. 7: 5. 1963.

This variety is said to differ from the typical form of the species in being scabrous and more robust, with short rigid hairs, long, denser and retrorse ones on the stem and midrib of the leaves, which are thicker and simple, the lower ones much larger. The original description actually reads as follows: "A type differt scabre robustioreque, pilis brevibus, regidisque, densioribus, longis, retrorsisque in caulo et nervio medio foliorum; haec crassioribus simplisibusque, inferiores multo majores sunt."

The type of the variety was gathered by an unknown collector at Huasco, Atacama, Chile, in September 1885, and is sheet no. 54741 in the herbarium of the Museo Nacional de Historia Natural at Santiago, Chile. The plant is known to me only from the original description.

VERBENA SULPHUREA var. **TALTALENSIS** Moldenke, Phytologia 3: 281. 1950.

Bibliography: Moldenke, Phytologia 3: 281 & 290. 1950; Moldenke, Résumé 122 & 474. 1959; Moldenke, Résumé Suppl. 6: 6. 1963.

This variety differs from the typical form of the species in having its inflorescences elongated and spicate, 4.5—10 cm. long, even during anthesis.

The type of this variety was collected by Ernesto Barros Valenzuela (no. 8032) at Taltal, Antofagasta, Chile, on September 26, 1940, and is deposited in the Britton Herbarium at the New York Botanical Garden. His no. 8033 was apparently collected at the same locality on the same day. Claude-Joseph 3547 seems to be a mixture of this variety and the typical form of the species.

In all, 3 herbarium specimens, including the type, have been examined by me.

Citations: CHILE: Antofagasta: Barros Valenzuela 8032 (N—type), 8033 (N). Valparaíso: Claude-Joseph 3547, in part (W—1281540).

VERBENA SUPINA L., Sp. Pl., ed. 1, 1: 21. 1753 [not V. supina Trag., 1552].

Synonymy: Peristereon hyppios Diosc., Med. Mat. 5: 496. 1529. Verbenaca supina Diosc., Med. Mat. 5: 496. 1529. Peristereona supinum Diosc., Med. Mat. 5: 496. 1529. Verbenaca supina Clus., Rar. Stirp. Hisp. Obser. Hist. 2: 372—373. 1576 [not Verbenaca supina Gesn., 1553, nor Ruel, 1551]. Sacra verbena hispanica minor L'Obel, Icon. Stirp. 535. 1591. Verbena supina clusii L'Obel, Icon. Stirp. index n.p. 1591. Verbena supina Clus., Rar. Plant. Hist. Stirp. 4: xlv & xlvi. 1601. Verbena tenuifolia C.

Bauhin, Pinax Theatr. Bot., ed. 1, 269. 1623. Verbenaca foemina Caesalp. ex C. Bauhin, Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbenaca supina (& foemina) Fuchs ex C. Bauhin, Pinax Theatr. Bot., ed. 1, 269, in syn. 1623. Verbenaca supina Fuchs apud Matth., Opera Omnia Comment. 741. 1624. Verbena foemina Caesalp. apud Matth., Opera Omnia Comment. 741. 1624. Verbenaca supina J. Bauhin, Hist. Plant. Univ. 3: 444. 1651. Verbenaca supina Matth., Apolog. 174. 1674. Verbenaca, supina, sive sacra herba Matth. apud J. Bauhin, Hist. Pl. Eur. 2: 494. 1689. Verbena tenuifolia supina flo. coerul. R. Morison, Pl. Hist. Univ. Oxon. 3: "408" [=418] & 419, sect. 11, pl. 25, fig. 7. 1699. Supina sive foemina Park. apud R. Morison, Pl. Hist. Univ. Oxon. 3: 419, in syn. 1699. Verbena; tenuifolia C. Bauhin apud Boerh., Ind. Alt. Plant. Hort. Acad. Lugd.-Bat., ed. 2, 1: 187. 1720. Verbena foliis decomposito-pinnatifidis, caule procumbente L., Hort. Cliff. 11. 1737. Verbena supina J. Bauhin apud L., Hort. Cliff. 11, in syn. 1737. Verbena foliis decomposito-pinnatifidis, caule diffuso L. apud A. van Royen, Fl. Leyd. Prod. 327. 1740. Verbenaca supina Cord. apud A. von Haller, Enum. Meth. Stirp. Helvet. 1: 661. 1742. Verbenaca supina s. femina Fuchs apud A. von Haller, Enum. Meth. Stirp. Helvet. 1: 661. 1742. Verbena foliis de composito-pinnatifidis caule diffuso L. apud Sauvages, Meth. Fol. Pl. Fl. Monspel. 248. 1751. Verbena procumbens Forsk., Fl. Aegypt.-arab. 10. 1775 [not V. procumbens Hayek, 1908]. Verbena radicans Moench, Meth. 369. 1794 [not V. radicans Gill. & Hook., 1829]. Verbena tetrandra; spicis filiformibus, solitariis; foliis bipinnatifidis L. apud Desf., Fl. Atlant. 1: 17, in syn. 1800. Verbenaca supina sive foemina Tabern. apud Desf., Fl. Atlant. 1: 17, in syn. 1800. Verbena spicis filiformibus, solitariis; foliis bipinnatifidis; caulibus ramosissimis, decumbentibus Lam. apud Poir. in Lam., Encycl. Méth. Bot. 8: 545, in syn. 1808. Verbena tetrandra, spicis filiformibus, solitariis; foliis bipinnatifidis L. apud Poir. in Lam., Encycl. Méth. Bot. 8: 545, in syn. 1808. Sacra verbena, hispanica, minor L'Obel apud Poir. in Lam., Encycl. Méth. Bot. 8: 545, in syn. 1808. Verbena supina, sive femina Tabern. apud Poir. in Lam., Encycl. Méth. Bot. 8: 545, in syn. 1808. Verbena tetrandra; spicis filiformibus solitariis; foliis bipinnatifidis Kniph. apud Picot de Lapeyr., Hist. Abrég. Pl. Pyrén. 13, in syn. 1813. Verbena supina β hirsuta Ehrenb. ex Sweet, Hort. Brit., ed. 2, 418. 1830. Verbena tetrandra, spicis filif. solitariis, fol. bipinnatifidis L. apud H. E. Richter, Cod. Bot. Linn. 36. 1835.

Bibliography: Diosc., Med. Mat. 5: 496. 1529; Brunfels, Herb. Viv. Icon. 1: 120. 1532; Ruel, Ped. Dioscorid. Anazarb., ed. 2,

520. 1551; Tragus, Stirp. Germ. 211. 1552; Gesner, Collect. Stirp. 113. 1553; Cordus, Op. Posth. 66. 1561; Clus., Rar. Stirp. Hisp. Obser. Hist. 2: 372—373. 1576; Dodon., Stirp. Hist. Pemptad., ed. 1, 150. 1583; Gesner, Stirp. Collect. 113. 1587; Tabern., Icon. Plant. 132. 1590; L'Obel, Icon. Stirp. 535 & index. 1591; Gerarde, Herbal 580—581. 1597; Gerarde, Hist. Plant. Emac. 718, fig. 2. 1597; Clus., Rar. Plant. Hist. Stirp. 4: xlv & xlvi. 1601; Dodon., Stirp. Hist. Pemptad., ed. 2, 150. 1616; C. Bauhin, Pinax Theatr. Bot., ed. 1, 269. 1623; Matth., Opera Omnia Comment. 741. 1624; J. Parkinson, Theat. Bot. 675. 1640; J. Bauhin, Hist. Plant. Univ., ed. 1, 3: 444. 1651; Matth., Apolog. 174. 1674; Matth., Comment. 393. 1680; P. Herm., Hort. Acad. Lugd.-Bat. Cat. 619. 1687; J. Bauhin, Hist. Pl. Eur. 2: 494. 1689; P. Herm., Fl. Lugd.-Bat. 55. 1690; R. Morison, Pl. Hist. Univ. Oxon. 3: "408" [=418] & 419, sect. 11, pl. 25, fig. 7. 1699; Tourn., Inst. Rei Herb. 200. 1700; Boerh., Ind. Plant. Hort. Acad. Lugd., ed. 1, 75. 1710; Boerh., Ind. Alt. Plant. Hort. Acad. Lugd., ed. 2, 1: 187 (1720) and ed. 3, 1: 187. 1727; L., Hort. Cliff. 11. 1737; A. van Royen, Fl. Leyd. Prod. 327. 1740; A. von Haller, Enum. Meth. Stirp. Helvet. 1: 551, 634, & 661. 1742; Sauvages, Meth. Fol. Pl. Fl. Monspel. 248. 1751; L., Sp. Pl., ed. 1, 1: 21. 1753; L., Syst. Nat., ed. 10, 852. 1759; Kniphof, Orig. Cent. 12: no. 99. 1764; Kniphof, Herb. Viv. 2: pl. 1157. 1764; P. Mill., Dict., ed. 8, Verbena no. 3. 1768; J. A. Murray in L., Syst. Veg., ed. 13, 62. 1774; Forsk., Fl. Aegypt.-arab. 10. 1775; Sabbat in Martelli, Hort. Roman. 3: 11. 1775; Christm. & Panzer, Vollst. Pflanzensyst. Houttuyn 5: 130. 1779; L'Hér., Stirp. Nov. 1: 22. 1786; Poir. in Lam., Encycl. Méth. Bot. [Illustr.] 1: 57. 1791; Moench, Meth. 369. 1794; Willd., Sp. Pl. 1: 120. 1797; C. Murr., Brit. Gard. 2: 479—480. 1799; Desf., Fl. Atlant. 1: 17. 1800; Lam. & DC., Fl. Franç. 3: 503. 1805; Poir. in Lam., Encycl. Méth. Bot. 8: 545—546. 1808; Dum. Cours., Bot. Cult., ed. 2, 2: 624. 1811; Picot de Lapeyr., Hist. Abrég. Pl. Pyrén. 12—13. 1813; J. Sm. in Rees, Cycl. 36: no. 23. 1817; Steud., Nom. Bot., ed. 1, 874. 1821; Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825; Sibthorp & Sm., Fl. Graec. 6: pl. 554. 1827; Sweet, Hort. Brit., ed. 2, 418. 1830; Host, Fl. Austr. 2: 180. 1831; H. E. Richter, Cod. Bot. Linn. 36. 1835; G. L. Petermann, Cod. Bot. Linn. Ind. Alph. 196. 1840; Sadl., Fl. Comit. Pest., ed. 2, 269. 1840; Steud., Nom. Bot., ed. 2, 2: 750. 1841; D. Dietr., Syn. Pl. 3: 605. 1843; Walp., Repert. 4: 25. 1845; Schau. in A. DC., Prodr. 11: 548. 1847; Schnitzlein, Iconogr. 2: pl. 137. 1856; Reichenb., Icon. Fl. Germ. 18: pl. 1292. 1857; Heuff., En. Pl. Ban. 146. 1858; Munby, Cat. Pl. Alg. 25. 1859; A. Irvine, Phytologist 1859: 342. 1859; Rupr., Fl. Ingrica 1: 563. 1860; Tornabene, Atti Accad. Gioenia di Sci. Nat. Catania, ser. 2, 16: 125. 1860; Neilr., Aufz. 170. 1866; Ascherson in G. Schweinf., Beitr. Fl. Aethiop. 1: 120. 1867; Benth. in Benth. & Hook. f., Gen. Pl. 2 (3): 1146. 1876; Loret & Barrandon, Fl. Montpel. 533. 1876; J. Ball, Journ. Linn. Soc. Lond. Bot. 16: 607. 1878; Pickering, Chron. Hist. Pl. 253 & 1220. 1879; Tristram, Surv. West. Palest., ed. 1, 378 (1884) and ed. 2, 378. 1888; Batt. & Trab., Fl. Alg. 1: 717. 1888; Briq. in

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Illustrations: Clus., Rar. Stirp. Hisp. Obser. Hist. 2: 373. 1576; Dodon., Stirp. Hist. Pemptad. 150. 1583; Tabern., Icon. Plant. 132. 1590; L'Obel, Icon. Stirp. 535. 1591; Gerarde, Herbal 580, fig. 2. 1597; Gerarde, Hist. Plant. Emac. 718, fig. 2. 1597; Clus., Rar. Plant. Hist. Stirp. 4: xlvi. 1601; J. Parkinson, Theat. Bot. 675. 1640; J. Bauhin, Hist. Plant. Univ., ed. 1, 3: 444. 1651; J. Bauhin, Hist. Pl. Eur. 2: 494. 1689; R. Morison, Pl. Hist. Univ. Oxon. 3: sect. 11, pl. 25, fig. 7. 1699; Kniphof, Orig. Cent. 12: no. 99 [in color]. 1764; Kniphof, Herb. Viv. 2: pl. 1157 [in color]. 1764; Sibth. & Sm., Fl. Graec. 6: pl. 554 [in color]. 1827; Schnitzlein, Iconogr. 2: pl. 137 [in color]. 1856; Reichenb., Icon. Fl. Germ. 18: pl. 1292 [in color]. 1857; Fiori & Paoletti, Icon. Fl. Ital. 2: fig. 3219. 1902; J. M. Black, Nat. Fl. S. Austral. 127. 1909; Hayek, Pflanzend. Oesterr.-Ung. 1: 520. 1916; Murdeck, Acta Univ. Lund. [Lunds Univ. Årsskr.], new ser., 17 (1): 19. 1921; Javorka & Csapody, Ic. Fl. Hungar. 418. 1932; Monod, Phanerogames in Contrib. Etude Sahara Occident. 2: pl. 22. 1939.

Low annual herb, usually densely pubescent throughout, sometimes almost glabrescent and shiny; stems usually procumbent and much branched from the base, subterete or subcompressed, more or less pubescent or subpubescent; branches mostly procumbent, strigose-hispid and more or less canescent, the tips often ascending or even erect; leaves decussate-opposite, varying from many-parted or pinnatifid to pinnatisect or bipinnatifid, deltoid in outline, cuneate at the base and decurrent into the petiole, the segments oblong, rather obtuse at the apex, dentate-incised or trifid, usually hispidulous on both surfaces, the venation impressed above, the margins revolute; inflorescence terminal, spicate, simple; spikes solitary, slender or filiform, at first short and dense, often elongating to 15 cm. in fruit; peduncles hairy; bractlets ciliate, usually about half as long as the calyx or sometimes more elongate, the lower ones lanceolate and equaling the calyx; calyx about 2 mm. long, strigose-canescent; corolla hypocrateriform, tiny, varying from blue or bluish to pale purplish-blue or lilac, its tube 3—4 mm. long, usually twice as long as the calyx, the limb 1—2 mm. wide; stamens 4; schizocarp obovoid-tetragonal, as long as the calyx or included by the fruiting-calyx; cocci obtusely carinate on the back, coarsely and transversely rugose toward the apex.

There is some question about the typification of this species. The original specimen of Linnaeus, preserved as sheet G.834, S.7, in the Linnean Herbarium at London, was collected by him in the George Clifford garden in England and shows erect stems and thus does not agree well with his description of either 1737 or 1753. In the Stockholm herbarium, however, there is a specimen of Loefling 16 which, in my opinion, should be regarded as the type. On the obverse side of the sheet there is written "VERBENA" in ink, and then near the bottom in pencil "cfr. Verbena 14 Supina L. sp. pl. 21", and then at the very bottom in ink in Linnaeus' own handwriting "14 supina". On the reverse side of the sheet there is written in pencil "Linné herb" and in ink "Verbena tetrandra, spicis filiformibus solitariis, foliis pinnatifidis Linn. Spec. plant. 21.14" and in ink in Linnaeus' own handwriting "Hispania 16 Loefl." The specimen is apparently of the supine form and thus agrees with the description of Linnaeus in 1753: "14. VERBENA tetrandra, spicis filiformibus solitariis, foliis bipinnatifidis. Verbena tenuifolia. Bauh. pin. 269. Verbena supina. Clus. hist. 2. p. 46. Habitat in Hispania." Cufodontis (1962) cites the type of the species as "ex Hispania".

Walpers (1845) classifies *V. supina* in his Section *Verbenaca*, Subsection *Inermes*, Group *Foliosae*, Subgroup *Micranthae*, and Secondary Subgroup *Schizophyllae*, with 9 other species. The specific name is sometimes uppercased, for no valid reason.

Verbena supina has been collected in dry as well as moist places, lowlands and arid deserts, parklands and plains, and on seaport ballast, at altitudes from sealevel to 90 meters, flowering in March and from May to September, fruiting in March, August, and September. It is native to the Mediterranean region and the Near East, introduced elsewhere. Baker & Stapf (1900) say of it "spread through the Mediterranean region"; Bentham (1876) says "orbi veteri propria, regionis Mediterraneae ab ins. Canariensibus usque ad Orientem incola." Eig, Zohary, & Feinbrunn (1931) report that in Palestine it inhabits moist places and lowlands, flowering from May to August; Zohary (1962) notes that it forms a part of the Crypsidetum minuartioidis ecologic association in that country. Mohr says that in 1893 it was a "common ballast weed" at Mobile, Alabama, while Black (1926) states that it is common on parklands and plains near Adelaide, South Australia. Douglas H. Kent, in a letter to me dated November 28, 1949, reports that it is adventive in England, and this statement is borne out by the reference in the bibliography given above and in specimens cited below. It has apparently existed in cultivation in England since 1799.

It should be noted here that the *Verbena supina* of Tragus is actually *Bidens tripartita* L. in the *Carduaceae*, the *V. femina* of Brunfels is *Erysimum officinale* L. in the *Brassicaceae*, the *V. procumbens* of Hayek is *V. hayekii* Moldenke, and the *Verbenaca supina* of Ruel and of Gesner is a mint. C. Bauhin (1623) places *Verbenaca foemina* Caesalp. and *Verbenaca supina (& foemina)* Fuchs in the synonymy of his *Verbena communis caeruleo flore* (which is what we now call *Verbena officinalis*), but I place them in the synonymy of *Verbena supina*.

It should perhaps also be mentioned here that the L., Sp. Pl. (1753) reference is often erroneously cited to page "29"; the Clusius [=L'Ecluse] reference (1601) is often given as "2: 46" or "2: 45--46, fig. 1"; and the J. Bauhin (1651) reference in the bibliography above is sometimes misdated "1650" or "1750". The publication by John Ball (1878) is often cited as "Ball, Spic."

Common names recorded for this species are "carpet vervain", "eysenkraut", "hairy vervain", "trailing Spanish vervain", "trailing vervain", "verminacola berbenaca", "vervaine femelle", and "verveine couchée".

Material of this species has been misidentified and distributed in herbaria under the names *V. canescens* H.B.K., *V. forskaelei* Vahl, *V. forskålei* Vahl, *V. gracilis* Desf., *V. spuria* L., and *Priva dentata* Pers. On the other hand, the *Field & Lazar 190* (in part), *Murbeck s.n.* [Dar Farik, 17/5/1896], and *Ruhmer s.n.* [Benghasi, 22/12/1882], distributed as V. supina, seem to be f. erecta Moldenke; C. B. Clarke 2018 is V. officinalis L.; Pappi 2981 is V. officinalis var. prostrata Gren. & Godr.; Eyles 4349 is V. wrightii A. Gray; G. Jermy s.n. [Ttara, 1853] is Heliotropium procumbens Mill. in the Heliotropiaceae; and Pitard 468 (at least insofar as the University of California at Los Angeles specimen is concerned) is Teucrium campanulatum L. in the Lamiaceae. The Kulikowski 858, cited below, may possibly represent f. erecta; Kneucker 266 is extremely white-hairy and may be taken as representing Ehrenberg's variety hirsuta. The Lund specimen of Sintenis 1045 approaches f. erecta, but the branches are too diffuse and the stems too hairy. Grossheim s.n. [26.IX.25] is a mixture with Phyla nodiflora (L.) Greene.

Schauer (1847) cites Tenore s.n. from Italy, Duby s.n. from Sicily, Sibthorpe s.n. and Fraas s.n. from Greece, Fenzl s.n. from along the river Danube in Hungary, Steven s.n. from the Caucasus, Kotschy 447 from Mesopotamia, Klotsch 323 from Nubia, Acerbi s.n., Coquebert de Montbret s.n., Aucher-Eloy s.n., Martins s.n., and Wiest 90 from Egypt, Desfontaines s.n. from Algeria, Boissier s.n. from Spain, and Broussonet & Chr. Smith s.n. from the Canary Islands, all deposited in the Berlin and DeCandolle herbaria.

Irvine (1859) records the species from Wandsworth, Surrey, England. Ascherson (1867) cites Cienkowsky s.n. [Seru, Fesoghlu, 7 März 1848] and Ehrenberg s.n. [Chandek & Dar-Mahas, Nubia]. Baker & Stapf (1900) cite Ehrenberg s.n. [Nubia], Schweinfurth 878, Pfund 180, Fazokl s.n., Cienkowsky s.n., and Kotschy 265 from the Nile area; Chevalier (1920) records the species from Mauritania, citing Lt. G. Schmitt 28548. C. I. Sandwith (1933) cited an unnumbered collection from Baptist Mills, Bristol, England; Rozeira (1944) cites Ferreira s.n. [Bragança] and s.n. [Murça], Sampaio s.n. [Vimioso], s.n. [Mirando-do-Douro], s.n. [Genízio], and s.n. [Foz-Tua], M. Lopes s.n., Maria s.n., and Rozeira s.n. from Portugal; and Monod (1952, 1954) cites his nos. 280 [217], 9014, and 908516 from Mauritania. Boucher cites Forskål 2475.

In all, 144 herbarium specimens, including the type, and 7 mounted photographs have been examined by me.

Citations: ALABAMA: Mobile Co.: C. T. Mohr s.n. [Hunter's Wharf, Sept. 5, 1892] (W--771870, W--771872), s.n. [Mobile, July 1893] (C). GREAT BRITAIN: England: Lousley s.n. [Sharpness Docks, 1 Juli 1957] (Z). PORTUGAL: Ferreira s.n. [Julho 1880] (S); Mendes Pinheiro 1493a (Br); Rainha 2419 (W--2189948). SPAIN: Alstroemer s.n. (S); Bourgeau 2463 (Du, N); Collector undesignated s.n. [in Hispania] (S); Herb. Mus. Bot. Stockholm s.n. (S); J. Lange s.n. [17 Jul. 1851-52] (S), s.n. [July 1852] (Du); Loefling 16 [Herb.

Linnaeus G.35, S.16] (E--photo of type, F--photo of type, Ls--isotype, N--photo of isotype, N--photo of type, S--type, Sg--photo of type, Z--photo of type), s.n. (S); E. Reverchon 81 (Pa); Sennen & Mauricio 7657 (Ba); Vahl s.n. (S). CZECHOSLOVAKIA: Lejeune s.n. (Br). HUNGARY: Borbás 934 (B, B, Go, S, W--811335); Bornmüller 1502 (B); Boros 5 (S), s.n. [30 Jul. 1933] (Ew, Gg--267621); Collector undesignated s.n. (Sg--16111); Herb. Bornmüller s.n. (B); Herb. Dörfler s.n. [1 Septembri 1884] (S); Janka 1853 (Ca--91015, Du, Du), s.n. [26 Septembr. 1860] (Gg--31452); G. Jermy s.n. (Ur--32001, W--315852); Korenl s.n. [26 Julio 1877] (Go); Kovács 460, in part (Ba, Br, Gg--163265, Go, S, Ur, W--1346993); Lengyel s.n. [23.VIII.1914] (B); Rácz s.n. [7.VIII.1911] (Go, S, Um--61); Tauscher s.n. [2 Julio 1878] (Go). GREECE: Heldreich 99 (S), s.n. [31 Jul. 1852] (S); Marie & Petitmengin 375 (La). ITALY: Herb. Martius s.n. [Palermo] (Br); Heuffel s.n. (Br). SICILY: Todaro 396 (Du, La, S), s.n. [1850] (S), s.n. (S). CRETE: Duffour 1507 (B, Vi). JUGOSLAVIA: Serbia: Sintenis 1669 (Lu). UNION OF SOCIALIST SOVIET REPUBLICS: Azerbaijan: Grossheim s.n. [26.IX.25] (B). Donetz: Gorschkowa 184 (S). Stalingrad: Becker s.n. [Sarepta] (Du). Ukrainia: Kulikowski 858 (Go, S). MOROCCO: Herb. Harvey s.n. [Tétuan, 1845] (Du--166468); Jahandiez 240 (Cp), 976 [Herb. Lacaitu 27915] (B, Bm); Lepiney, Rungs, & Sauvage 2503 (S); Sennen & Mauricio 8866 (Um--44). ALGERIA: Bové s.n. [Septembre 1839] (Du--166467); L. Chevalier 81 (Du); Cosson s.n. [29 Juill. 1854] (S), s.n. [20 Mai 1856] (Go); O. Debeaux s.n. [Pran, 28 avril 1883] (Br, Du), s.n. [1883] (Br); Jamin 3503 (Um--63); Le Cesve s.n. [7/6/1934] (Gg--223437); Munby s.n. [circa lacum Halsula] (W--147591); Reboud 2209 (Du). TUNISIA: Doumet-Adanson & Bonnet s.n. [29 avril 1884] (Br); Kralik 321 (Du); Pitard-Briau 468 (Go, Vt), s.n. [Gabès] (Vt). CYRENAICA: Ruhmer 262 (Br). EGYPT: Aucher-Eloy 2700 (Du--166450); Boucher 363 (Du--166500); C. G. Ehrenberg s.n. [IV. Cahiro] (S); A. Gray s.n. [Egypt & Nubia, 1869] (T); F. E. Hubbard s.n. [Feb. 24, 1868] (W--71956); Kneucker 266 (B); Kotschy s.n. [Blue Nile] (T); Kralik 13479 (Vi--126), s.n. [22/3/47] (Bm), s.n. [20 fév. 1848] (S), s.n. [Matarich, Cairo, Mart.] (W--147590); Letourneux s.n. [April 1876] (I); Samaritani s.n. (S); Schweinfurth s.n. [Cairo, 1880] (W--806208), s.n. [10 Juni 1887] (Br); Sieber 2 (Lu), s.n. [Beniseuf] (Bm, Vt); Täckholm s.n. [Luxor, 23/1/1927] (Ka); A. Wiest 90 [Herb. Prager 18642] (Du, Gg--31454). SUDAN: Nubia: Kotschy 323 (Du--166451, Lu, S). ARABIA: Yemen: Herb. Mus. Bot. Lund. s.n. [Arabia felix] (Lu). TURKEY: Ascherson 1045 (Br); Sintenis 1045 (Lu, S). ISRAEL: Jouannet-Marie 671 (Du). LEBANON: Gombault 4008 (S). JORDAN: Field & Lazar 190, in part (Du--235839).

SYRIA: Herb. U. S. Dept. Agr. s.n. (W—71957); Post 48 (W—805057). PAKISTAN: Sind: Kotschy 515 (S). MALAYA: Malacca: Collector undesignated s.n. [circa Malaccam] (Lu). CULTIVATED: Belgium: Lejeune s.n. (Br). England: Linnaeus s.n. [Hort. Cliff G. 834, S.7; Bailey Hort. neg. 6408] (N—photo). France: Herb. Decaisne s.n. [h. P. 1822] (Br). Germany: Herb. Calif. Acad. Sci. 31453 (Gg); Herb. Prager 18637 (Gg—31455). Italy: Herb. Harvey s.n. [h. R. P. 1819] (Du—166466). LOCALITY OF COLLECTION UNDETERMINED: Boisduval s.n. (W—71989); Collector undesignated 77 (Q); Hazslinszky s.n. [Kisupszallas] (W—71958); Herb. Alm. s.n. (S); Herb. Harvey s.n. (Du—166501); Herb. Mus. Bot. Stockholm s.n. [21/8] (S); Herb. Mus. Paris. s.n. (Ca—983626); Herb. Osbeck 2 (S); Mauricio s.n. [Melilla, VIII.1939] (Vi); Osbeck s.n. (S,S).

VERBENA SUPINA f. ERECTA Moldenke, Phytologia 2: 339, 340, & 342, nom. nud. (1947), f. nov.

Synonymy: Verbena supina var. major Foumerque ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Verbena supina var. glabra Lojac. ex Moldenke, Résumé 376, in syn. 1959. Verbena supina var. erecta Bég. ex Moldenke, Résumé 376, in syn. 1959. Verbena supina f. erecta Sennen & Mauricio ex Moldenke, Résumé Suppl. 1: 23, in syn. 1959. Verbena supina var. subglabriuscula Lindberg ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963.

Bibliography: Moldenke, Phytologia 2: 339, 340, & 342. 1947; Moldenke, Alph. List Invalid Names Suppl. 1: 27. 1947; Moldenke, Alph. List Cit. 2: 619 (1948), 3: 849, 934, & 940 (1949), and 4: 1082, 1137, 1167, 1168, 1180, 1224, & 1292. 1949; Moldenke, Phytologia 3: 136 & 138. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 108—110, 124, & 199. 1949; Moldenke, Résumé 130, 132—134, 158, 376, 426, 427, & 474. 1959; Moldenke, Résumé Suppl. 1: 8, 11, & 23 (1959), 2: 5 & 6 (1960), and 7: 10. 1963.

Haec forma a forma typica caulis erectis recedit.

This form differs from the typical form of the species in having its stems usually erect or suberect.

The type of this form was collected by Elisée Reverchon (no. 81) in waste places at Algeciras in southwestern Spain on June 24, 1887, and is deposited in the herbarium of the Botaniska Trädgarden at Göteborg, Sweden. Actually, one or more of the trinomial names listed above in the synonymy may have priority over the name here adopted, but I have not as yet been able to find any earlier valid publication for any of them. It seems that the f. erecta of Sennen & Mauricio is based on their no. 8500 from Morocco, while var. subglabriuscula is based on H. Lindberg 489 from Spain.

Material of this form has been collected in flower and fruit in June. Herbarium material has been widely distributed as V. supina L. More study is needed to determine the actual taxonomic status of this form, which seems at times to intergrade with the typical form or perhaps to hybridize with it. Material of Rainha 785, Sennen & Mauricio 7657, Kovács 460, Balansa 193, Kralik 321, Letiurneux s. n., Täckholm s.n., A. Wiest 90, Kotschy 323, Ascherson 1045, and Field & Lazar 1045, cited by me under V. supina, may, upon reexamination, prove to represent f. erecta instead.

In all, 65 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: PORTUGAL: Rainha 785 [Herb. Estac. Agron. Nac. 19870] (Mv, S). SPAIN: H. Lindberg 489 (B, Lu); E. Reverchon 81 (Br--isotype, Go--type, N--photo of type, S--isotype, Z--photo of type); Rigo 408 (B); M. Winkler s.n. [21 April 1873] (Br). HUNGARY: Heuffel s.n. (Pa); Kovács 460, in part (Ca--253693, Mv, Z). ITALY: Gavioli s.n. [VII.1938] (N). UNION OF SOCIALIST SOVIET REPUBLICS: Azerbaijan: Grossheim s.n. [V.1930] (S). MOROCCO: Quer 544 (B, Ca--484875, S); Sennen & Mauricio 7657 (Um--46), 8500 (Um--45); C. Skottsberg s.n. [2/6/1936] (Go), s.n. [6/4/1936] (Go); Uggla s.n. [2/4/1936] (S); E. Wall 5, in part [3/536] (S, S). ALGERIA: Balansa 193 (S, Vi--127); Bové 124 (Br); L. Chevalier 81a (Ob--6730), 81 bis (W--550297, W--1178267); Collector undesignated 257 (B); G. L. Durand 129 (Um--64); A. Faure s.n. [5 Mai 1911] (Ca--317427, N, S); Foumerque s.n. [13/6/89] (Du); LeCesve 7557 (B). TUNISIA: Herb. Lemmon s.n. (Ca--330212); Kralik 321 (B, S); Murbeck s.n. [Dar Farik, 17/5/1896] (Lu, S). CYRENAICA: Ruhmer s. n. [Benghasi, 22/12/1882] (Lu); Vaccari 183 (Go). EGYPT: Letourneux s.n. [April 1876] (S); Samaritani s.n. [27 April 1856] (S); Sickenberger s.n. [3 avril 1879] (Du); Sieber Fl. Mixta s.n. [Damiate] (M); Täckholm s.n. [23/1/1927] (S); A. Wiest 90 (M, S). SUDAN: Nubia: Kotschy 323 (Br). TURKEY: Ascherson 1045 (Du). JORDAN: Field & Lazar 190 (Ca--620379, N, N, S, W--1628833). IRAQ: Ahmed s.n. [Bakhtari, 24.2.47] (W--2272695); Bornmüller 1653 (B); Field & Lazar 530 (N). LOCALITY OF COLLECTION UNDETERMINED: Baker s.n. [Fl. Parept.] (Br); Herb. Mus. Bot. Stockholm s.n. (S); Sieber s.n. (Du--15818).

VERBENA SUPINA var. MINOR Post, Fl. Syria, ed. 2, 2: 322 & 925. 1933.

Bibliography: Post, Fl. Syria, ed. 2, 2: 322 & 925. 1933; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 124 & 199. 1949; Moldenke, Résumé 158 & 474. 1959.

This variety is said to differ from the typical form of the species in having its leaves less dissected and the spikes only 2--5 cm. long.

Post, in the reference cited above, infers that he originally published this trinomial in 1896, but, if so, I have not as yet been able to find the reference. It does not seem to be included in his bibliography. Therefore it seems probable that the only specimen which he cites in 1933 is also the type of the variety -- apparently collected by himself at Akar-Dagh, in the "district from Tripoli as far as Mar'ash", Lebanon, and deposited in the Post Herbarium.

VERBENA SWIFTIANA Moldenke, Phytologia 2: 427--428. 1948.

Bibliography: Moldenke, Phytologia 2: 427--428. 1948; Moldenke, Castanea 13: 119. 1948; Moldenke, Alph. List Cit. 3: 916 (1949) and 4: 1257. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 107. 1949; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Résumé 128 & 474. 1959.

Low slender herb, 15--30 cm. tall; stems slender, often partly procumbent and rooting at the nodes, acutely tetragonal, glabrous, brunnescent; branches numerous, often simple or nearly so, erect, very slender, acutely tetragonal, brunnescent, glabrous; nodes annulate; principal internodes 1--2 cm. long; leaves decussate-opposite, numerous; petioles very slender, 1--3 mm. long, glabrous, or obscure and winged, merging into the blades; leaf-blades membranous, uniformly brunnescent on both surfaces, 1--2 cm. long, varying from linear or very narrowly elliptic and entire to ovate and trifid with the large terminal lobe entire or several-toothed or -incised, glabrous on both surfaces; midrib very tenuous, mostly indiscernible above, very slightly prominulous beneath; secondaries and veinlets indiscernible on both surfaces; inflorescence terminal, spicate, rather few-flowered, to about 5 cm. long, the flowers rather distant during and after anthesis; peduncles slender, exactly similar to the branches in color and texture, 1--1.5 cm. long; rachis exactly similar to the peduncle; bractlets lanceolate, about 1 mm. long and 0.5 mm. wide, acuminate at the apex, lightly strigillose; calyx tubular, about 1.5 mm. long and 0.75 mm. wide, lightly strigillose outside, the rim very shortly toothed; corolla hypocrateriform, pink or rose, its tube very slender, about 3 mm. long, very sparsely and minutely strigillose toward the apex, the limb about 3 mm. wide, very lightly and minutely strigillose toward the base outside.

The type of this species was collected by Gerardo Juan Schwarz (no. 3402) at Corpus, dept. San Ignacio, Misiones, Argentina, on September 19, 1946, and is deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm. The species is named in honor of Josiah Otis Swift (1870--1948), well-known naturalist, founder of the Yosian Brotherhood which in the past half century has brought the beauties of the great out-of-doors to over 200,000 Americans, chiefly in the vicinity of New York City. He was author of the daily column "News Outside the Door" which popularized Nature Study among millions of newspaper readers.

The species has been collected on river shores, flowering in September and November, fruiting in November. In all, 12 herbarium specimens, including the type, have been examined by me.

Citations: ARGENTINA: Misiones: Ekman 2019 (Mi, N, N, S), 2020

(Mi, N, N, S); G. J. Schwarz 3402 (F--photo of type, Gg--isotype, N--isotype, N--photo of type, S--type, S--isotype, Si--photo of type, Sw--photo of type, Z--photo of type).

VERBENA TAMPENSIS Nash, Bull. Torrey Bot. Club 23: 104. 1896.

Synonymy: Glandularia tampensis (Nash) Small, Man. 1139 & 1508. 1933. Verbena tampeusis Nash ex Moldenke, Alph. List Invalid Names Suppl. 1: 27, in syn. 1947. Grandularia tampensis (Nash) Small ex Moldenke, Résumé 297, in syn. 1959.

Bibliography: Nash, Bull. Torrey Bot. Club 23: 104. 1896; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 191. 1904; Moldenke, List Spec. Mold. Southeast. Set 10. 1930; Perry, Ann. Mo. Bot. Gard. 20: 243, 248, 250, 311, 321--322, & 356. 1933; J. K. Small, Man. 1139 & 1508. 1933; A. W. Hill, Ind. Kew. Suppl. 9: 124. 1938; Moldenke, Annot. & Classif. List 109. 1939; Moldenke, Prelim. Alph. List Invalid Names 26. 1940; Moldenke, Addisonia 21: 59. 1942; Moldenke, Alph. List Invalid Names 21. 1942; Schnack & Covas, Darwiniana 6: 476. 1944; Moldenke, Am. Midl. Nat. 32: 576. 1945; Moldenke, Castanea 10: 37. 1945; Moldenke, Alph. List Cit. 1: 72, 139, 140, 152, 197, 213, 278, 291, 292, 294, 295, 505, 508, 510, & 512. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 27. 1947; Moldenke, Castanea 13: 111. 1948; Moldenke, Am. Wild Fls. 292 & 450. 1949; Moldenke, Alph. List Cit. 3: 721, 741, 742, 760, 786, 800, 851, 852, 941--943, & 946 (1949) and 4: 1003, 1112, 1177, 1192, 1210, 1216, 1218, 1227, & 1253. 1949; Moldenke, Résumé 14, 296, 297, 376, & 474. 1959; Moldenke, Résumé Suppl. 3: 3. 1962; Moldenke, Phytologia 8: 435, 437, & 439 (1962), 9: 194 (1963), and 10: 124 & 125. 1964.

An herb, varying from decumbent or procumbent to erect, glabrous or pubescent with short appressed hairs; stems and branches erect or ascending from a decumbent and often creeping base, 2--6 dm. long, usually more or less branched, usually minutely pubescent, sometimes glabrate; leaves decussate-opposite; petioles 0.5--2.5 cm. long; leaf-blades oval or ovate to oblong-ovate, lanceolate, or elliptic, paler beneath, 2--8 cm. long, 1.5--4 cm. wide, acute at the apex, truncate at the base, cuneately narrowed into the margined petiole, coarsely and irregularly serrate, serrate-dentate, or crenate-dentate to shallowly incised or incised-serrate, entire on the basal cuneation, strigillose or glabrate on both surfaces; spikes pedunculate, 2--10 cm. long, capitate when young, fascicle-like in anthesis, becoming cylindric-elongate in age and often interrupted below in fruit; bractlets subulate or linear-subulate, strigillose, ciliate, about half as long as the calyx; calyx 12--15 mm. long, strigillose, the longer teeth setaceous-subulate, 2--4 mm. long; corolla hypocrateriform, varying from blue to purple or rose-purple, its tube about 1.5 cm. long or surpassing the calyx by 2--4 mm., pubescent on the outer surface and in the throat, the limb 10--12 mm. wide, the lobes obovate, emarginate at the apex; anthers without a gland or with a very small one on the connective of each of the upper pair of stamens; fruiting-calyx 12--13 mm. long, strigillose, the lobes very slender, unequal, subulate; mature schizocarp slightly constricted along the lines of cleavage; cocci cylindric or subcylindric, about 4 mm. long, with a broadened base, furrowed or striate toward the base and areolate or reticulate-scrobiculate toward the apex or coarsely pitted from the middle to the apex, the commissural surface minutely scabrous.

The type of this species was collected by George Valentine Nash (no. 2470) just back of the beach line at Ballast Point, near Tampa, Hillsborough County, Florida. The collector notes that "in general appearance this plant has some resemblance to V. Aubletia, but a critical examination will readily show the differences. The entire absence of the gland on the anther connective, a character of the section in which V. Aubletia is placed, at once makes manifest its dissimilarity to that species."

The species has been collected on riverbanks and weedy sandy flats, at the borders of hammocks, along roadsides, and in dry sandy soil, muck soil, cypress swamps, low open woods, pinelands, hammocks, and wet or high hammocks, flowering and fruiting from February to June, and in September and December. The specific name is sometimes uppercased. Deam found "a large colony in cypress swamp". Nebb comments "anther tips small or wanting". Curtiss 1963 is a mixture -- the part [1963*] from "sandy ridges bordering the ocean, eastern Florida" is V. maritima Small; the part [1963**] from "roadsides near Charleston" is V. bonariensis L.; and the part from "low open woods, Indian River, June" is V. tampensis Nash.

Material of V. tampensis has been misidentified and distributed in herbaria under the names V. aubletia L., V. canadensis (L.) Britton, V. lambertii Sims, V. maritima Small, and Glandularia maritima (Small) Small. On the other hand, the Curtiss 5706, A. A. Eaton 546, W. H. Rhoades 6, and E. West s.n. [Chattahoochee, 8 Sept. 1931], distributed as V. tampensis, are all V. maritima Small. The Collector undesignated s.n. specimen in the University of Vermont herbarium is a mixture with Stylodon carneus (Medic.) Moldenke.

Perry (1933) cites the following 14 additional specimens not as yet seen by me: FLORIDA: Brevard Co.: Curtiss 1963, in part [low open woods, Indian River, June] (E, G, W); Fredholm 5804 (G). Broward Co.: J. P. Young 737 (W). Dade Co.: Edw. Palmer 6433 (E). Hillsborough Co.: G. V. Nash 2470 (G--isotype). Lee Co.: W. Kellogg s.n. [Owanita, 18 March 1907] (G); P. C. Standley s.n. [thicket along river, Pondilla, 8 March 1927] (W). Manatee Co.: Rugel 305 (E, F); S. M. Tracy 6650 (E, G). Volusia Co.: Mell s.n. [Daytona, 24 Jan. 1907] (E). The Nash 2470 which she cites from "NY" is actually in the Columbia University herbarium; the "Mattern" s.n. which she cites is doubtless the Mattern & Mattern s.n. cited by me below; the "Small 8469" which she cites is a typographic error for Small 8649; and the "Standley s.n." which she cites may be the P. C. Standley 52577 cited by me. She says "Verbena tampensis, apparently endemic in peninsular Florida, is very similar in habit to V. canadensis. It differs in having more shallowly incised or dentate leaves, a strigillose calyx, slightly longer nutlets, and essentially glandless anthers. The nutlets are enlarged at the base somewhat more than those of closely related species."

In all, 87 herbarium specimens, including the types of all the names involved, have been examined by me.

Citations: FLORIDA: Brevard Co.: Brown & West s.n. [Rockledge, 4-6-28] (Fl--20981); W. M. Canby s.n. [Febr. 1889] (Pa); Curtiss 1963, in part [low open woods, Indian River, June] (Bc, C, Cm, I, Pa, Vt), 5706 (Ka); Mattern & Mattern s.n. [Titusville, March 31, 1914] (W--910330); W. H. Rhoades s.n. [Cocoa, Sept. 7, 1936] (Fl--12861, H--51418), s.n. [Indianola, Feb. 3, 1937] (Fl--25896); J. K. Small 8732 (N), s.n. [Cocoa, May 9, 1918] (Hi--7209, Up). Dade Co.: Edw. Palmer 396, in part (Bc). Hillsborough Co.: F. S. Blanton 6936 (Ml, N), s.n. [Dec. 14, 1930] (I); A. P. Garber s.n. [Tampa, May 1876] (C, W--265076); G. V. Nash 2470 (C--type, Es--isotype); C. L. Pollard s.n. [Tampa, March 7, 1898] (W--328227). Lake Co.: J. K. Small 8649 (N). Lee Co.: Buswell s.n. [June 1930] (Bu); C. C. Deam 58711 (Dm, N), 58795 (Dm, N), 60759 (N); P. C. Standley 52577 (W--1308777). Manatee Co.: C. H. M. Barrett 13 (W--893560); Cuthbert s.n. [Palma Sola, March 26, 1926] (Fl--20983); P. Dowell 7101 (N, Um--47); Nebb s.n. [March 1887] (Pa); Rugel 305 (Bm, N, W--512258); S. M. Tracy 6650 (N, N, W--383903), 7808 (Cm); Weber & Kelbert s.n. [Palmetto, 3-15-28] (Fl--20980). Orange Co.: H. N. Moldenke 212 (E, N, Up, Ur). Pinellas Co.: Beckwith 772 (W--1200200); R. F. Thorne 10281 (Ca--965339). Polk Co.: McFarlin 4477 (Gg--237856). Saint Lucie Co.: Small & Matthaus 9635 (H--43153, S, W--1738478). Sarasota Co.: Fattig s.n. [Venice, 4-24-28] (Sa); H. N. Moldenke 1039 (B, E, Go, H--5480, N, S, Up, Ur, W--1567275); H. H. Rusby s.n. [Sarasota, Febr. 12, 1935] (N); B. H. Smith s.n. [Osprey, March 17, 1904] (Cm, H--23135). Volusia Co.: F. Beckwith 773 (W--1200201); S. M. Deam 1831 (Du--80274); Eastwood s.n. [Holly Hill, May '90] (Bl--42278); Friesner 2037 (Bt--5987, Bt--5994, Bt--6028); B. H. Patterson s.n. [Daytona, Feb. 23, 1918] (Cm), s.n. [Daytona, Feb. 1925] (Cm); J. K. Small 8686 (Fl--27705, N, N, S, W); Small & DeWinkeler 9856 (S). Merritt's Island: A. A. Baldwin 70 (N). County undetermined: H. C. Beardslee s.n. [Cheney Highway, March 15, 1933] (Ob--97290); Collector undesignated s.n. (Vt, Vt).

xVERBENA TEASII Moldenke, Phytologia 2: 28--29. 1941.

Synonymy: Verbena erinoides x hybrida Dermen, Cytologia 7: 163. 1936. Verbena hybrida x erinoides Dermen, Cytologia 7: 163, 165, & 169. 1936. Verbena hybrida x erinoides Teas ex Moldenke, Suppl. List Invalid Names 9, in syn. 1941. Verbena hybrida Voss x V. tenuisecta Briq. ex Moldenke, Alph. List Invalid Names 47, in syn. 1942. Verbena teash Moldenke, Am. Midl. Nat. 59: 362, sphalm. 1958. Verbena tenuisecta Briq. x V. hybrida Voss ex Moldenke, Résumé 376, in syn. 1959.

Bibliography: Dermen, Cytologia 7: 163, 165, & 169, fig. 3--5, 23, 24, & 43. 1936; Moldenke, Suppl. List Invalid Names 9. 1941; Moldenke, Phytologia 2: 28--29. 1941; Moldenke, Alph. List Invalid Names 47. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 74 & 102. 1942; Moldenke in Lundell, Fl. Texas 3 (1): 41. 1942; Moldenke, Phytologia 2: 66, 70, 78, 83, & 117. 1945; Moldenke, Alph. List Cit. 1: 17, 20, & 23. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 24, 25, & 27. 1947; Moldenke, Castanea 13: 121. 1948; H. N. & A. L. Moldenke, Pl. Life 2: 85. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 165 & 199. 1949; Moldenke, Alph. List Cit. 3: 970 (1949) and 4: 987. 1949; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209 & 2212. 1951; E. J. Salisb., Ind. Kew. Suppl. 11: 263. 1953; Moldenke, Journ. Calif. Hort. Soc. 15: 82 & 83. 1954; Moldenke, Am. Midl. Nat. 59: 362. 1958; Moldenke, Résumé 224, 364, 366, 376, & 474. 1959; Moldenke, Phytologia 8: 121. 1961; A. Putz, N. Y. Herald Trib., sec. 4, p. 18, February 4. 1962; Moldenke, Phytologia 9: 315. 1963.

Illustrations: Dermen, Cytologia 7: 163, fig. 3--5, 165, fig. 23 & 24, & 169, fig. 43. 1936; A. Putz, N. Y. Herald Trib., sec. 4, p. 18, February 4 [as "V. erinoides"]. 1962.

This is the garden hybrid between V. tenuisecta Briq. and xV. hybrida Voss, with intermediate characters. Stems decumbent or ascending, abundantly branched; branches ascending, slender, obtusely tetragonal, sparsely or densely whitish-hirsutulous with rather stiff hairs or merely spreading-pilose, the smaller branches often more acutely tetragonal; leaves decussate-opposite, very variable in shape and size, varying from densely strigose with long white appressed hairs on both surfaces to sparsely strigillose above and spreading-pubescent along the midrib and larger venation beneath, more or less deeply incised-pinnatifid or irregularly incised, often more or less 3-parted, the lowest divisions usually again pinnatifid-incised, the lobes all sharply acute at the apex, the body of the leaf-blade and the lowest lobes often relatively broad, with recurved secondary lobes; spikes at first flattened-subcapitate, later elongating to 15 cm. or more, very densely many-flowered, the flowers closely imbricate before, during, and after anthesis; peduncles (1.5—7 cm. long) and rachis slender, acutely tetragonal, densely hirsutulous or spreading-pilose, not glandular; bractlets relatively very short, lanceolate, about 4 mm. long, about 1/3 as long as the calyx, attenuate at the apex, rather densely white-strigillose with appressed hairs, densely white-ciliate toward the base; calyx elongate-tubular, 8—13 mm. long, densely short-pubescent with spreading hairs or white-strigose with closely appressed hairs; corolla hypocrateriform, showy, varying from blue or purple to pink or white, its tube 15—20 mm. long, about 1 1/3 times as long as the calyx, glabrous throughout or slightly puberulent at the apex on the outer surface, the limb 5—9 mm. wide.

This hybrid appears to have been made first in the nurseries of Edward Teas at Houston, Texas, in 1926, and was called "V. hybrida x erinoides" by him. It is typified, however, by a collection made by Glendon A. Stevens (no. 4) at Harrisburg, Dauphin County, Pennsylvania, on June 20, 1933, and deposited in the herbarium of the Bailey Hortorium at Cornell University, Ithaca, New York. In 1936 it was produced artificially by Dermen in Massachusetts.

Under the collective name, xV. teasii, I include the garden varieties called Albion, Bellaire, Ceres, Madge Roberts, Rowena, Ruth, and Teas Hybrid Verbena or Teas Hybrid Vervain. The corolla is white in Albion, pink in Rowena and Ruth, purplish in Bellaire, and dark-red in Ceres. The plant has been collected in anthesis in April, June, July, and October, so apparently has a long blooming period. Material has been distributed in herbaria under the names V. incisa Hook., "V. erinoides hybrid", and "Common verbena x erinoides". Madge Roberts is said by Teas to be "probably the best of the race". Bailey says for his unnumbered specimens, cited below, collected on July 22 and on October 3, 1927 "root from Edw. Teas, Houston, Tex., in spring of 1927"; his no. 7394 represents Bellaire, 7395 is Ceres, and 7396 is Madge Roberts.

A letter written by G. A. Stevens of the G. Horace McFarland Company, Harrisburg, Pennsylvania, addressed to Dr. Liberty Hyde Bailey and dated June 20, 1933, is of considerable interest in the information it gives about the color forms of xV. teasii:

"Dr. McFarland wrote you today about the Texas verbenas. I am sending you by accompanying mail some samples which I hope will reach you in fair condition at least.

"I am afraid that Dr. McFarland got the history of them a little mixed. Teas sent us originally four varieties. They were named, and I believe he reported them to be selections from the native verbena or hybrids of it. The four varieties included -

"1. A purple violet type which seems to come pretty close to the botanical description of Verbena venosa.

"2. A good light rose-pink variety, a little variable in color but is very similar to the purple sort, except that the flower trusses are better filled and the plant seems to be a trifle more vigorous.

"3. A rather impure white variety which seems to have considerable pink at times in the flowers. It differs from the former two in having broader and more substantial foliage.

"4. A very ugly magenta-pink which was so bad that we threw it away at the end of the first year. I do not remember anything about it beyond that it resembled the other three in a general way.

"All four of these verbenas were reported to be hardy. They are not definitely so at Harrisburg, although they survive in a cold frame without trouble. But six miles north of Harrisburg on the southern slope of the first mountain a friend of mine has a rock garden, to which I contributed some of each of the three varieties which we kept. They flourish exceedingly well and sometimes live over winter, particularly a branch which may creep under a stone and take root there. You will note from the specimens that they are very flat trailing plants and root as they run.

"It was in that garden that the red variety originated, evidently as a sport from either the white or pink variety. You will note that the foliage of the red one closely resembles that of the white sort. I do not believe it is a seedling, since no other seedlings of these have ever appeared, although the ugly lavender type which I discarded has appeared several times in plantings of the purple sort at the mountain. We have never propagated these plants from seeds, using cuttings only. Besides in its color the red form differs from the other three in its much flatter habit and shorter growth. It is an exceedingly neat edging or bedding plant.

"I am almost positive that no verbenas of the usual garden type were growing in the garden at the mountain last year, and I know that there were none in the nearest garden to it, which is about a quarter-mile away. But the seed which produced this red verbena, if it is a seedling, must have been formed in 1931, and I cannot say definitely whether other verbenas were growing there that year, but certainly none was in the rock garden."

The illustration given by Putz (1962) is labeled "Verbena erinoides", but certainly does not represent that species; it seems clear to me that the plant depicted is xV. teasii.

In all, 21 herbarium specimens, including type material of all the names involved, and 2 mounted photographs have been examined by me.

Citations: CULTIVATED: California: Bailey & Bailey 9830 (Ba). Haiti: Ekman H.9357 (S). New York: L. H. Bailey s.n. [July 27, 1927; Bellaire] (Ba), s.n. [July 27, 1927; Ceres] (Ba), s.n. [July 27, 1927; Rowena] (Ba), s.n. [July 27, 1927; Ruth] (Ba), s.n. [Oct. 3, 1927; Rowena] (Ba). Pennsylvania: G. A. Stevens 1 (Ba), 2 (Ba), 3 (Ba), 4 (Ba—type, N--photo of type, Z--photo of type). Texas: L. H. Bailey 7394 (Ba), 7395 (Ba), 7396 (Ba); Teas s.n. [June 2, 1926; Albion] (Ba), s.n. [June 1926; Albion] (Ba), s.n. [June 1926; Bellaire] (Ba), s.n. [June 1926; hybrids] (Ba), s.n. [June 1926; Madge Roberts] (Ba), s.n. [June 1926; Rowena] (Ba), s.n. [June 1926; Ruth] (Ba).

VERBENA TENERA Spreng. in L., Syst. Veg., ed. 16, 2: 750. 1825.

Synonymy: Shuttleworthia tenera Walp., Repert. 4: 13. 1845. Schuttleworthia tenera Walp. apud Morren, Hort. Belg. 20: 111, in syn. 1870. Verbena geraniifolia Hort. ex Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1261. 1873. *Verbena geraniaefolia* Hort. apud Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1178, in syn. 1895. *Verbena tenera* Griseb. ex Alvarez, Fl. Sant. del Estero 106. 1919. *Verbena apulchellas* Sw. ex Augusto, Fl. Rio Grande do Sul 233, sphalm. 1946. *Glandularia tenera* (Spreng.) Cabrera, Man. Fl. Alreded. Buenos Aires 398. 1953. *Verbena tenuisecta* f. *arenaria* Herter ex Moldenke, Résumé 376, in syn. 1959. *Verbena montana* Lillo ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963 [not *V. montana* Hort., 1895]. *Verbena tenella* Michx. ex Moldenke, Résumé Suppl. 6: 11, in syn. 1963. *Verbena tenera* Auct. ex Moldenke, Résumé Suppl. 8: 6, in syn. 1964. *Verbena tenera* Briq. ex Moldenke, Résumé Suppl. 8: 6, in syn. 1964.

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Illustrations: Reider, Ann. Blumisterei 8: [pl. 12] (in color) [as *V. pulchella*]. 1832; Morren, Belg. Hort. 20: 111 [in color]. 1870; Bois, Atlas Pl. Jard. pl. 227 [in color]. 1896; Step, Fav. Fl. Gard. & Greenh. 3: pl. 220 [in color]. 1897; T. H. Everett, New Illustr. Encycl. Gard. 13: 2405. 1960.

Typically quite small, long-trailing or creeping plant, suffruticose at the base; stems cespitose, filiform, much-branched, diffuse, decumbent, rooting at the nodes; branches ascending, filiform, diffuse, tetragonal, pubescent and retrorsely muriculate; leaves decussate-opposite, rather firm, decurrent at the base into a short petiole; leaf-blades dark-green above, paler beneath, 3-parted and multifid or pinnatifid-laciniate to -dissected, the lobes linear, entire, rather acute at the apex, shiny, subrevolute, scattered-strigillose; inflorescence terminal, pedunculate, the spikes solitary or ternate, at first fasciculate, elongating after anthesis, subcanescent; bractlets lanceolate, about 5 mm. long, acuminate at the apex; calyx elongate, 6--10 mm. long, membranous, plicate, hirtellous, the pubescence ascending-spreading, not appressed and not glandular, the ribs herbaceous, prominulous, the rim oblique, the teeth subulate; corolla infundibular, varying from wholly pink, pink, rose, light-pink, or violet-pink to violet, lilac, purple-lilac, purple, dark-purple, blue-purple, blue-violet, lilac-blue, or even blue, glabrous outside or puberulous above, its tube 10--15 mm. long, usually almost twice as long as the calyx, barbate within at the stamen insertion, otherwise glabrous, the limb medium-sized, the lobes uniformly colored, cuneate-obcordate; appendages on the upper anthers clavate or claviculate, subrecurved, glandulose, included or not very conspicuously exserted, dark-violet; fruiting-calyx contracted and contorted beyond the fruit, about 3 mm. long; cocci 4, subterete, fuscous, striate on the back, reticulate-scrobiculate except at the very base, the commissural surface smoothish; chromosome number: 2n = 10 or 30.

The type of this species was collected by Friedrich Sellow at Montevideo, Uruguay, and was deposited in the herbarium of the Botanisches Museum at Berlin, but is now destroyed.

This is a much misunderstood species. By horticulturists the name is often misapplied to *V. pulchella* Sweet, but in *V. tenera* the spikes elongate after anthesis and typically the plant is quite small, while in *V. pulchella* the spikes do not elongate and the plants are often quite large. It is also often confused with *V. tenuisecta* Briq., from which it may be distinguished at once by its calyx pubescence being ascending-spreading hirtellous instead of appressed-strigose. Cultivated forms have the leaves closely resembling those of *V. dissecta* Willd. and *V. laciniata* (L.) Briq., from both of which species they differ in having the bractlets about 5 mm. long and the calyx about 10 mm. long. Schauer (1851) says "calyce......strigoso-pubescente.....ad angulos glandulis patellaeformibus brevibus stipitatis consperso duplo brevioribus". Meisner described the cocci as splitting in pairs, but Schauer contradicts this.

Hauman-Merck (1913) cites his *no. 349* and says that the species is abundant in sandy places in *Río Negro*, Argentina. He comments that it is difficult to separate from *V. erinoides* Lam. and that Grisebach in his Pl. Lorentz. mistook them, but that the distinctive features given in his Symb. Fl. Argent. (no. 1746) are of no value since some specimens of *V. tenera* are also herbaceous and have leaves with linear segments as in V. erinoides. He states that careful comparison of the descriptions of the two species in DeCandolle's Prodromus reveals only one difference: the glands on the calyx in V. tenera (which he admits that he has never seen on Argentine specimens). He concludes that from a study of literature and numerous actual specimens the distinguishing characters are: V. tenera -- staminal glands pyriform punctate under a handlens, almost as large as the anthers and distinctly visible in the corolla-throat; V. erinoides -- staminal glands cylindric, much smaller than the anthers, included or hardly visible in the corolla-throat.

Steudel (1841) places V. pulchella Hort. in the synonymy of V. tenera. Morren (1870) places V. pulchella Sweet and Schuttleworthia pulchella Meisn. in the synonymy of V. tenera; Schauer (1847 & 1851), Jackson (1895), and Augusto (1946) do the same, and so does A. Saint-Hilaire, but I regard this as incorrect. The two species are abundantly distinct. Morren shows three color forms of V. tenera on his unnumbered color plate. Regel (1879) reduces V. tenera to synonymy under V. pulchella, and also places V. sabini Hort. and V. multifida Hort. there -- the former is regarded by me as V. laciniata var. sabini (Sweet) Moldenke and the latter as V. laciniata (L.) Briq. Briquet (1904) opined that V. sabini Sweet might belong with V. tenera. Neal (1948) regards V. tenera as a synonym of V. pulchella, but the plants referred to by her all prove to be V. tenuisecta Briq. Rümpler (1873) and Rodiges (1902) also reduced V. tenera to synonymy under V. pulchella.

It should be noted here that the Alvarez, Fl. Sant. del Estero 106 (1919) reference is sometimes given as page "109" in error -- on that page there is only a picture of Iodina rhombifolia of the Santalaceae.

Osten, in a note about the plant now called xV. uruguayensis Moldenke (which see), questions whether Briquet's use of the name V. tenera is the same as Sprengel's, but I see no reason to doubt it.

The type of V. tenuisecta f. arenaria is apparently Herter 749, collected in dry and sandy sunny places along the seashore at Uararrillas, dept. Rocha, Uruguay, between November 15 and 17, 1948; V. montana Lillo seems to be based on Ventúri 6726 from Tucumán, Argentina, and V. tenella Michx. is based on C. T. Mohr s.n. from Mobile, Mobile County, Alabama, collected on May 10, 1893. Verbena montana Hort. is a synonym of V. canadensis (L.) Britton. The V. tenera var. tristachya Troncoso & Burkart is now known as V. tristachya Troncoso & Burkart; the so-called V. tenera x aubletia Winge is xV. wingei Moldenke; V. tenera x incisa x erinoides Hegi is xV. trinitensis Moldenke; and V. tenera x lanceolata Kellogg is V. tenuisecta Briq. The "V. tenera" portions of these hybrid designations are based on misidentifications. The only true hybrid known to me thus far involving the authentic *V. tenera* is with *V. peruviana* (L.) Briq. and is now known as *xV. uruguayensis* Moldenke.

Verbena tenera has been collected in dry sandy sunny places along the seashore, on ballast ground, in low places in meadows, in fields and low or sandy fields, campos and pampas, dry grassy campos, dry meadows, and in sandy rather bare dry or moist places. Herter found it in sandy rocky soil in dry hollows exposed to full sunlight; Rambo encountered it in a region of 2 meters rainfall and 0—25° temperature range. Other collectors have found it in sandy or rocky soil, dry rocky pastures, grassy slopes, river forests, pastured thorn-bush, and on the littoral, at altitudes of 25 to 2500 meters, flowering from September to April and in July, fruiting in November, December, and March. It has been in cultivation since at least 1832.

Among its recorded vernacular names are "camaradinha", "formosa sem dote", "jurupeba", "margarita morada", "sacha-alfa", "sister vervain", "te de burro", "Uruguayan verbena", "Uruguayan vervain", "verbena americana", "verveine délicate", "verveine gentille", "verveine jolie", and "yerba meona". The name "sacha-alfa" is applied also to *V. laciniata* (L.) Briq. in Argentina according to Alvarez (1919), while "camaradinha", "formosa sem dote", and "jurupeba" seem to be applied to all the species of this genus growing in southern Brazil.

In my 1948 publication I pointed out that *V. tenera* was not known from Texas, even in cultivation, when I prepared my discussion of this family for the Flora of Texas. Now it is known to be cultivated there and, like all cultivated vervains, may be expected eventually as an escape or naturalization. It is not nearly as common in cultivation anywhere as *V. tenuisecta*, which it closely resembles, but from which it differs in its bractlets being about half (instead of 1/4) as long as the calyx and densely long-ciliate on the margins and in the short but spreading often hirsutulous pubescence on the calyx (instead of the closely appressed-strigose pubescence seen in *V. tenuisecta*).

The corolla color is described as "pink" on *Reitz 3481*; "wholly pink" on *Moldenke 8070*; "light-pink" on *N. Y. Bot. Gard. Cult. Pl. R.75/34*; "violet-pink" on *Herter 749*; "rose" on *Reitz & Klein 7460*; "lilac" on *Burkart 18149*, *Legrand 2664*, and *Osten 2748*; "purple-lilac" on *Osten 19032*; "purple" on *Berro 8701 & 8775*; "dark-purple" on *Lundell 10938*; "blue-purple" on *Berro 8205*; "blue-violet" on *Hauman s.n.*; "blue or violet" on *Berro 4752*; "violet" on *Arechavaleta 23*, *Berro 4323*, *Burkart 22380*, *Gallinal & al. PE.5048*, *Hunziker 3733*, *5160*, & *6471*, *Krapovickas 2752*, *Legrand 1942*, and *Schröder s.n.*; and "blue" on *Berro 134*, *4753*, *4754*, *6720*, *8219*, & *8390* and *Sparre 412*. *Moldenke 8070* is said to have originated as a mutant from material of var. *maonetti* Regel.

Bally (1956) notes that contrary to Beale, who found in an American strain of this species a chromosome count of 2n = 30, Datta found in an Italian strain a count of 2n = 10. Different types of meiotic irregularities were met with, including nondisjunctions. The occurrence of multivalents in some individuals with 2n = 10 chromosomes is ascribed by Datta to those plants having resulted from the union of two abnormal gametes, one lacking one chromosome, the other possessing an extra one, the latter being of another type from the one missing in the other gamete. Plants with the normal diploid number may thus originate with a genomic constitution differing from the normal. An unusually high number of secondary constrictions is reported by Datta, which may have originated through non-homologous interchanges involving nucleolar chromosomes.

Swallen describes the species as "very common on campo" along roadsides in Rio Grande do Sul; Burkart found it "common in low places in meadows" in the province of Buenos Aires; Hunziker describes it as "frequent at edge of highway" in Córdoba; while Osorio says "entre les piedras del terraplen al costado de la carretera" in Uruguay. Bailey (1935) reports that its seeds are offered to the horticultural trade by Kew. Douglas H. Kent, in a letter to me dated November 28, 1949, reports that the species is adventive in England. Roig (1945) says "propiedado vulnerarias y adamás sirven para lavar el pelo y evitar su caída" in Cuba. Everett (1960) notes that "*Verbena tenera* and its variety are not generally hardy in the north, although they may survive in sheltered locations as far north as Philadelphia." Gay (1849) says of the genus *Verbena* "En Chile son muy comunes, pero es sin duda por equivocacion que se le ha mencionado la *Verb. tenera* de Spr."

The labels on Macbride's type photograph *no. 17450* are inscribed "Brazil", but the specimen depicted was collected by Friedrich Sellow (*no. 99*) in fields about Montevideo, Uruguay, and is probably to be regarded as the actual type of the species, deposited in the Berlin herbarium and now lamentably destroyed.

The *Jörgensen 1737* collection cited below was erroneously cited by me in my *Alph.* List Cit. 2: 599 (1948) as *V. microphylla* H.B.K. His *no. 1026* is a mixture with *V. glandulifera* Moldenke. Material of *V. tenera* has been misidentified and distributed in herbaria under the names *V. alpina* Hort., *V. chamaedrifolia* Cham., *V. dissecta* Willd., *V. erinoides* Lam., *V. glandularia* Jörgensen, *V. laciniata* (L.) Briq., *V. microphylla* H.B.K., *V. pulchella* Sweet, *V. radicans* Gill. & Hook., *V. santiagensis* Brücher, *V. sororia* Don, *V. tenuisecta* Briq., and *Schuttelworthia pulchella* Meisn. On the other hand, the *J. H. Kellogg s.n.* [Mo. Bot. Gard., Aug. 25, 1911], distributed as *V. tenera*, is actually *V. ambrosifolia* Rydb.; *Kuntze s.n.* [Ceres, Oct. 1892] is *V. dissecta* Willd.; *J. H. Cowen s.n.* [Cornell U., Ithaca, April 1900] is V. *pulchella* Sweet; *Cabrera 3244*, *Castellanos s.n.* [Valle de los Reartes, Dec. 15, 1919], *Che-*

bataroff s.n. [San Javier, 1939], Dusén 9341, Eastwood s.n. [Huntington's Place, Aug. 1915], J. G. Gilmore 1792, Herb. Decaisne s.n. [H. P.], Herb. Osten 13012, 15290, 17303, 19032, & 23345, Herter s.n. [Nueva Palmira], Hieronymus s.n. [14.XI.1875], s.n. [near Córdoba, 14.XI.1876], & s.n. [in vicinity of Córdoba, Nov. 18, 1876], R. Jones 102, Kuntze s.n. [Córdoba, 15/XII/1891], Lefebre s.n. [1885], Lilliesköld s.n., Lorentz 1483.6, Neal s.n. [Apr. 11, 1929], Osten 13107, Parodi 8962, Pedley 534, H. M. Pollard s.n. [June 7, 1957], Schröder s.n. [dept. Paysandú, Dec. 1924], H. H. Smith 140, H. M. Smith 5, Stratton 6125 (in part), Torrey & Wood s.n. [July 3, 1946], Troncoso 984, and E. Wall s.n. [Nelspruit, 25/10/38] are V. tenuisecta Briq.; and Hauthal 26 is V. thymoides Cham.

Schauer (1847) cites Sellow s.n. from "in campis Brasiliae meridionalis" and Arsene-Isabelle s.n. and Bacle s.n. from "civit. Platensium" in the Berlin and DeCandolle herbaria. In Rep. Bot. Exch. Club Brit. Isles (1919 & 1933) there are cited a collection by Misses Cobbe from a "rubbish tip, Bedminster, Bristol", England, in 1918, and a collection made by C. I. Sandwith in 1932. Ragonese (1941) cites his nos. 2003 and 2396 from Santa Fé, Argentina. Augusto (1946) cites a Sellow s.n. and Isabelle s.n. from "campos de Montevideo", Bornmüller s.n. from "Rio Grande do Sul, Salto Alegre, ao norte de Pindorama", and Augusto & Edésio s.n. from "Praia de Tramanda" in Rio Grande do Sul.

In all, 181 herbarium specimens, including the type collections of most of the names involved, and 2 mounted photographs have been examined by me.

Citations: ALABAMA: Mobile Co.: C. T. Mohr s.n. [Mobile, May 10, 1893] (W--771882), s.n. [Mobile, June 3 to Sept. 1893] (W--771883). BRAZIL: Paraná: L. Fernandez s.n. [Herb. Mus. Paran. 3383] (N); Herb. Mus. Nac. Rio Jan. 46598 (Ja). Rio de Janeiro: N. J. Andersson s.n. [1851] (S). Rio Grande do Sul: Buck 1837 (N); C. Camargo 62124 (S); Friedrichs 32939 (N); Jürgens 118 (B); Malme 242 (S), 348 (N, S); Rambo 34719 (N, S); A. R. Schultz 508 (N); Schwacke II.262 (Ja--46577); Sehnem 3466 (Gg--356387), 5052 (B); Swallen 7391 (W--1903226). Santa Catarina: F. Müller 95 (Ja--46533); Reitz 3481 (N); Reitz & Klein 7460 (Mm), 7724 (Mm), 7919 (S, Z). State undetermined: Sellow 427 (Vt), s.n. [Brasilia] (Br, N, Vt). URUGUAY: N. J. Andersson s.n. [Monte Video, 1852] (S); Arechavaleta 23 (Ug); H. H. Bartlett 19862 (Mi), 20821 (Mi, Mi, W--1907610); C. Berg 161 (Ug--9615); Berro 134 (N), 4323 (N), 4752 (N), 4753 (N), 4754 (N), 6720 (N), 6800 (N), 8205 (N), 8219 (N), 8390 (N), 8701 (N), 8702 (N), 8775 (N), s.n. [Mercedes, Jan. 10, 1899; Herb. Osten 3746] (Ug); Cabrera 3244 (N); Castellanos s.n. [near Cerro Pelado, Dec. 26, 1946; Herb. Inst. Miguel Lillo

11755] (N, N), s.n. [La Coronada, Dec. 9, 1947; Herb. Inst. Miguel Lillo 11766] (N), s.n. [Arroyo Casupá, Dec. 7, 1947; Herb. Inst. Miguel Lillo 11768] (N), s.n. [Manantial, Jan. 23, 1947; Herb. Inst. Miguel Lillo 15126] (N), s.n. [Cerro Verde, Jan. 18, 1947; Herb. Inst. Miguel Lillo 15138] (N, N), s.n. [entre Arroyo Timote y Mansavillagra, Nov. 1, 1946; Herb. Inst. Miguel Lillo 15774] (N); Felippone 5915 (N); Gallinal, Aragone, Bergalli, Campal, & Rosengurtt 2299 (W--1742790), PE.5048 (Ug--8175); Herter 181a [Herb. Herter 68181] (Ca--278518), 181b [Herb. Herter 32157] (Ca--278519), 181c [Herb. Herter 79227] (Ca--278521, N), 181 1/2 [Herb. Herter 96600] (N), 749 [Herb. Herter 50596] (S); Herter & Strahl 181 [Herb. Herter 79174] (Gg--222541, N, S); Legrand 250 (Ug), 1942 (Ug), 2664 (Ug), 2717 (N, Ug), 3856 (Ug), 4440 (Ug), 4590 (Ug); Moldenke & Legrand 2791 (N, Ug); Moldenke & Moldenke 19692 (Es, F, Mg, Mr, N, No, Ot, S, Sm, Ss, Ss), 19696 (Es, N, Ot, Ot, Sm); Osorio 199 (Ug--13002), 273 (Ug--12957); Osten 19032 (Ug); Rosa Mato 322 (Ug--9812); A. Saint-Hilaire C^{2}.1882 ter (N); Schröder s.n. [Santa Ysabel, Feb. 28, 1922; Herb. Osten 16546, in part] (Ug); Sellow 99 [Macbride photos 17450] (Kr--photo of type, N--photo of type); H. M. Smith 5 (W--1193661), 140 (W--1193793); G. Teague s.n. [Cuchilla Pereyra, Feb. 22, 1947; Herb. Inst. Miguel Lillo 11760] (N, N), s.n. [Carrasco, Montevideo] (Ug--12282). ARGENTINA: Buenos Aires: Boffa 25 (N, N, S); Burkart 18149 (N), 22380 (W--2371533); Cabrera 1860 (N); Commerson s.n. [Buenos Ayres] (N); Hauman s.n. [Bahia Blanca, XII.1905] (Br), s.n. [Sierra de Ventana, Nov. 1914] (Br); Hunziker 3333 (N); Krapovickas 1990 (Ca), 2752 (N); Lejeune s.n. [1827] (Br); Mansel s.n. [Bahia Blanca, 1884] (Bm); T. Meyer 2409 (N); Osten 2748 (Ug); Parodi 8962 (N); Remiro s.n. [Mercedes, 20,V.1943] (Mv); Rodriguez V. 667 (S); Scala & Cabrera 11 (N); Sparre 189 (S). Catamarca: Jörgensen 1026, in part (Ca--192385), 1737 [Herb. Inst. Miguel Lillo 31472; Herb. Osten 11009] (N, Ug, W--874768). Córdoba: Hieronymus s.n. [Herb. Krause 16830] (Ca--453738); Hunziker 6471 (N); Meyer & Sleumer s.n. [T. Meyer 15579] (B); Rodrigo 255 (N); Scala 10002 (N). Corrientes: Alboff s.n. [environs de la ville de Corrientes](N); Castellanos s.n. [Herb. Mus. Argent. Cienc. Nat. 34481] (N); Edw. Palmer s.n. (W--227527). La Rioja: Hunziker 5160 (N). Mendoza: Gillies s.n. [Mendoza] (Lu); Jörgensen 1026, in part (Cp); Ruíz Leal 1940 (Rl), 7092 (N), 11037 (Ss), 16934 (Z). Río Negro: Wilkes s.n. [Rio Negro, Patagonia] (W--71953). Salta: Garolera & Romero s.n. [Cuesta del Obispo, 8-I-1947] (N); Schreiter 6643 [Herb. Inst. Miguel Lillo 32795] (N). Santa Fé: Job 795 (N), 1050 (N). Tucumán: Lillo 8644 [Herb. Inst. Miguel Lillo 31473] (N); Olea 236 (Ca--166279); Venturi 6726 (W--1591498); E. Wall s.n. [15/10/1946] (S).

Province undetermined: Sparre 412 [Guardia Escotta] (S). CULTIVATED: Belgium: M. Martens s.n. [Hort. Colpia or. 1832] (Br); Thielens s.n. (Br). California: Walther s.n. [Santa Monica, Sept. 9, 1927] (Gg—165705). Congo: RR. PP. Salèsiens 292 (Br). Connecticut: Bevoise s.n. [Green Farms, Aug. 1934] (Ba). Hawaii: J. W. Thompson s.n. (Pa). Louisiana: Langlois s.n. [April 1880] (I). New York: Ahles s.n. [N. Y. Bot. Gard. Cult. Pl. R.95/34] (N); Herb. Univ. Mass. s.n. [N. Y., Aug. 1864] (Ms); H. N. Moldenke 8070 (N); Moldenke & Moldenke 11882 (N); H. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. R.95/34] (Ba, N). Russia: Herb. Hort. Bot. Petrop. s.n. (W—71959). Sweden: Reuterman s.n. [31/7/1886] (Go). Texas: C. L. Lundell 10938 (N, Rf). LOCALITY OF COLLECTION UNDETERMINED: J. Anderson 33 [South America] (Bm); Collector undesignated 99 [Herb. Mus. Nac. Rio ref. IX] (Ja), 427 (Ja); Herb. Jard. Bot. Brux. s.n. [Route du Grand Canal, 800 m. alt., 13 Sept. 1897] (Br); Née 89 (Q), 97 (Q).

VERBENA TENERA var. ALBIFLORA Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898.

Bibliography: Kuntze, Rev. Gen. Pl. 3 (2): 258. 1898; Moldenke, Phytologia 2: 386. 1947; Moldenke, Alph. List Cit. 2: 627 (1948), 3: 671 & 743 (1949), and 4: 1090. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 100, 107, & 199. 1949; Moldenke, Phytologia 3: 306. 1950; Moldenke, Résumé 120, 128, & 474. 1959.

This variety differs from the typical form of the species in having white corollas. It is described as a creeping plant, 40—50 cm. tall.

The type of the variety was collected by Carl Ernst Otto Kuntze at Ceres, Santa Fé, Argentina, in October, 1892, and is deposited in the Britton Herbarium at the New York Botanical Garden. The plant has been collected in sandy places, on pedregal of dry river, and on rock shelves, at altitudes of 200 to 700 meters, flowering from September to December. Material has been distributed in herbaria as "Verbena aff. laciniata". Legrand says of his no. 2665 that it was a single plant with white flowers among V. dissecta Willd.

In all, 7 herbarium specimens, including the type, have been examined by me.

Citations: URUGUAY: Legrand 2665 (Ug); Lombardo 2761 (N). ARGENTINA: Buenos Aires: Rodríguez Vaquero 666 (S); Sparre 246 (S). Jujuy: Venturi 5267 (Gg—158515, W—1591467). Santa Fé: Kuntze s.n. [Ceres, Oct. 1892] (N—type).

VERBENA TENERA var. MAONETTI Regel, Gartenfl. 4: 373, pl. 142, fig. 1. 1855.

Synonymy: Verbena maonetti Hort. ex Regel, Gartenfl. 4: 373, pl. 142, in syn. 1855. Verbena tenera maonetti Hort. ex Planch.

& Van Houtte, Fl. des Serres 11: 115, pl. 1129. 1856. Verbena pulchella var. mahoneti Vilm., Fl. Pl. Terre, ed. 1, 938. 1865. Verbena mahoneti Hort. ex Vilm., Fl. Pl. Terre, ed. 1, 938, in syn. 1865. Verbena pulchella var. mahoneti Hort. ex Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1261. 1873. Verbena pulchella var. maonetti Regel, Gartenfl. 28; 372. 1879. Verbena tenera var. maonettii Hort. ex Cowen & Bailey in L. H. Bailey, Stand. Cycl. Hort. 6: 3445. 1917. Verbena pulchella maonettii Regel ex Stapf, Ind. Lond. 6: 431. 1931. Verbena tenera maonettii Hort. ex Stapf, Ind. Lond. 6: 431. 1931. Verbena pulchella var. maonetti (Regel) Regel ex Moldenke, Cult. Pl. 35, nom. nud. 1938. Verbena alpina Hort. ex Moldenke, Prelim. Alph. List Invalid Names 44, in syn. 1940. Verbena tenera var. mahonetii Hort. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena pulchella var. maoretti Hort. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena tenera var. maanettii Hort. ex Moldenke, Suppl. List Invalid Names 10, in syn. 1941. Verbena alpina Cronamere ex Moldenke, Alph. List Invalid Names Suppl. 1: 22, in syn. 1947. Verbena mahanettii Hort. ex Moldenke, Résumé 369, in syn. 1959. Verbena tenera maonettii Regel ex T. H. Everett, New Illustr. Encycl. Gard. 13: 2405. 1960. Verbena mahonetti Hort. ex Moldenke, Résumé Suppl. 7: 9, in syn. 1963. Verbena tenera maanetti Hort. ex Moldenke, Résumé Suppl. 7: 10, in syn. 1963.

Bibliography: Regel, Gartenfl. 4: 373, pl. 142, fig. 1. 1855; Planch. & Van Houtte, Fl. des Serres 11 [ser. 2, 1]: 115, pl. 1129. 1856; Vilm., Fl. Pl. Terre, ed. 1, 938. 1865; Morren, Belg. Hort. 20: 111. 1870; Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1261--1262. 1873; Regel, Gartenfl. 28: 372. 1879; Vilm., Album de Clichés, ed. 2, fig. 25675. 1888; Jacks. in Hook. f. & Jacks., Ind. Kew. 2: 1179. 1895; Ed. Rodiges, Bull. Arboricult. Belg. 1902: 113 & 114. 1902; P. Henderson, Handb. Pl., new ed., 476. 1910; Cowen & Bailey in L. H. Bailey, Stand. Cycl. Hort. 6: 3445. 1917; Hegi, Illustr. Fl. Mittel-Eur. 5 (3): 2240. 1927; Stapf, Ind. Lond. 6: 431. 1931; L. H. & E. Z. Bailey, Hortus, new rev. ed., 632. 1935; Moldenke, Cult. Pl. 35. 1938; Moldenke, Annot. & Classif. List 108. 1939; Moldenke, Prelim. Alph. List Invalid Names 44 & 47--49. 1940; Moldenke, Saxiflora pl. 16. 1940; Moldenke, Suppl. List Invalid Names 10. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 75 & 102. 1942; Moldenke, Alph. List Invalid Names 44 & 48--51. 1942; Moldenke, Phytologia 2: 75 & 117. 1945; Moldenke, Alph. List Cit. 1: 19, 40, & 195. 1946; Moldenke, Alph. List Invalid Names Suppl. 1: 22 & 27. 1947; Moldenke, Castanea 13: 121. 1948; Moldenke, Alph. List Cit. 3: 658, 743, 768, 770, 771, & 904 (1949) and 4: 1104, 1154, 1204, & 1253. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 165 & 199. 1949; Politi, The Garden 2 (4): 22. 1950; Stumpp & Walter, 1950 Gard. Ann. 76. 1950; Moldenke in Chittenden, Roy. Hort. Soc. Dict. Gard. 6: 2209. 1951;

Henderson, Stumpp, & Walter, Everything for Gard. 1952: 78. 1952; Moldenke, Journ. Calif. Hort. Soc. 15: 83. 1954; Mattoon, Pl. Buyers Guide, ed. 6, 287. 1958; Moldenke, Résumé 224, 357, 369, 373, 376, & 474. 1959; T. H. Everett, New Illustr. Encycl. Gard. 13: 2405. 1960; Moldenke, Résumé Suppl. 2: 13 (1960) and 7: 9 & 10. 1963; Moldenke, Phytologia 11: 23 & 25. 1964.

Illustrations: Regel, Gartenfl. 4: 373, pl. 142, fig. 1 [in color]. 1855; Planch. & Van Houtte, Fl. des Serres 11 [ser. 2, 1]: pl. 1129 [in color]. 1856; Morren, Belg. Hort. 20: 111 [in color]. 1870; Rümpler in Vilm., Illustr. Blumeng., ed. 1, 1262. 1873; Regel, Gartenfl. 28: 372. 1879; Vilm., Album de Clichées, ed. 2, fig. 25675. 1888; P. Henderson, Handb. Pl., new ed., 476. 1910; Moldenke, Saxiflora pl. 16. 1940.

This variety differs from the typical form of the species in having its corolla-lobes conspicuously white-rayed and white-margined or only white-margined. The corolla itself varies from pink or rose to violet-rose or reddish-violet.

The variety is apparently of garden origin and is known thus far only from cultivated material. It is, however, to be expected in the wild. It has been collected in anthesis from June to September. Common name for it are "Italian verbena", "Italian vervain", "Mahonet's Verbene", and "vervain". Bailey (1935) states that the seeds are offered to the horticultural trade by Cronamere; Mattoon (1958) says that they are offered by John Forbes (Hawick).

Stumpp & Walter (1950) say "Give an open sunny exposure; protect with a covering of leaves over winter -- pink and white striped flowers on a trailing plant; blooms all summer; 6 in." Henderson, Stumpp, & Walter (1952) state that the plant requires drained soil in sunlight. Everett (1960) comments that "The variety occasionally produces branches bearing flowers of the same color as the ordinary type."

The plants of this variety cultivated at the New York Botanical Garden, specimens from which are cited below, originated in the garden of Clarence Lewis at Stirlington, New York. The specimen preserved as H. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. R.122/34] in the Britton Herbarium, cited below, was the basis for the illustration in Saxiflora (1940). Here and in my other 1940 publication (sse bibliography) I regarded the correct name for this plant as V. pulchella var. maonetti (Regel) Regel, but I have since been convinced that the taxon is more closely related to V. tenera. The reference to Regel, Gartenfl. 4: 373 (1855) is incorrectly cited to volume "6" by Stapf (1931).

Material of this variety has been misidentified and distributed in herbaria as V. pulchella Sweet. On the other hand, the Eastwood s.n. [Huntingdon's Place, Aug. 1915] and Walther 141 & s.n. [Pasadena, June 1921], distributed as V. tenera var. maonetti, are actually V. tenuisecta Briq.

Rümpler (1873) discusses this variety as follows: "Blumen purpurrosa oder carmin, bisweilen rosa-violett, die Lappen der Bluenkrone abwechselnd mit weiszen Streifen bezeichnet, die zusammen einen Stern bilden. Man hat von dieser Race auch mehrere Varietäten mit einfarbig zart-rosenrothen, lebhaft-rosenrothen und violett-rosigen Blumen. Wegen ihrer geringen Höhe, ihres raschen Wachsthums und der Dauer ihrer niedlichen Blumen, wie wegen der Eleganz ihrer Beleubung ist diese Verbene zur Bildung von Einfassungen und Teppich-beeten, zur Bepflanzung von Abhängen, Büschungen, Hügeln, wie auch zur Ausstattung der Rabatten höchst werthvoll. Ihre zahlreichen Aeste und Zweige breiten sich in jeder Richtung auf dem Boden aus und wirzeln sich in dem Masse ein, in dem sie sich verlängern, wodurch diefe Pflanze in vielen Fällen sehr nützlich wird.

"Die Varietät Mahoneti ist erst zu Anfang der sechzigen Jahre in der Gärten eingeführt worden; mit ihren zahlreichen, auf farbigen Grunde weiss-gesternten Blumen macht sie einen sehr angenekmem Effekt; sie scheint robuster zu sein und der Trocknisz besser zu widerstehen, als die Stammart. Man bildet aus ihr hoch-elegante Teppichbeete und reizende Topfpflanzen. Man hat jetzt auch eine grosze Anzahl von Farben, von denen mehrere ohne weiszen Stern. Einige dieser Farbenvarietäten der Verbena Mahoneti hat man aus Samen und durch künstliche Befruchtung gewonnen; aber die ersten in den Handel gekommenen Varietäten waren nach einigen Berichten das Resultat zufälliger Farbenwandlung, welche auf einigen Zweigen von Pflanzen, die der Stammform Mahoneti gehören, auftraten und durch Stecklinge fortgepflanzt wurden. Die Stammart bringt gern und selbst reichlich Samen, so dasz man die gewöhnlich als Einjährige behandelt; man säet sie in der Weise, wie bei Nr. 1 [V. canadensis] angegeben. Die Varietät Mahoneti und ihre Untervarietäten dagegen erzeugen sehr selten Samen, weshalb man sie gewöhnlich aus Stecklingen vermehrt, was das ganze Jahr hindurch geschehen kann, aber vorzugsweise im Herbst; die Schalen mit den Stecklingen überwintert man unter Glas. Man kann aber auch im Frühjahr aus Zweigen der unter Glas überwinterten alten Pflanzen Stecklinge im Mistbeet und im Sommer auch wohl im freien Lande machen. Wie elegant und hübsch aber auch diese Varietät ist, so wird sie doch jetzt weit weniger häufig kultivirt, als in früherer Zeit, wahrscheinlich der etwas umständlicheren Vermehrung wegen."

Hegi (1927) regards these plants as representing a multiple hybrid, V. tenera x incisa x erinoides, which, he says, gave rise to "bunte Blumisten Verbenen" and "italienischen Blumisten Verbenen". I discuss this hybrid under xV. trinitensis Moldenke, which is morphologically quite different.

In all, 16 herbarium specimens and 2 mounted illustrations have been examined by me.

Citations: CULTIVATED: California: Eastwood s.n. [San Francisco, July 10, 1915] (Gg--31411); Walther s.n. [Mill Valley, July 24, 1929] (Gg--165704). Connecticut: Bevoise s.n. [Green Farms, Aug. 1934] (Ba). England: L. H. Bailey s.n. [Kew, Aug. 8, 1919] (Ba); Nelmes 1200 (Ba); Stearn s.n. [Moldenke & Moldenke 9216]

(N). Italy: Gresino s.n. [VIII.1928] (N). New York: T. H. Everett s.n. [May 25, 1934] (N); McSweeney s.n. [N. Y. Bot. Gard. Cult. Pl. R.122/34] (N); H. N. Moldenke 8071 (N); Moldenke & Moldenke 11883 (N); New York Bot. Gard. Cult. Pl. 9068 (N--photo); H. Schneider s.n. [N. Y. Bot. Gard. Cult. Pl. R.122/34] (Ba, N); M. Zimmerman 17 (Ba). Pennsylvania: Clausen & Lawrence H.272 [Lew 52736] (Ba), H.399 (Ba). MOUNTED ILLUSTRATIONS: Vilm., Album de Clichées, ed. 2, fig. 25675. 1888 (N).

xVERBENA TENTAMENTA Moldenke, Résumé Suppl. 4: 10, 11, & 18, hyponym (1962), nom. nov.

Synonymy: Glandularia perakii x peruviana Schnack & Covas, Darwiniana 7: 73, in textu. 1945. Verbena perakii (Covas & Schnack) Moldenke x V. peruviana (L.) Britton ex Moldenke, Résumé Suppl. 4: 18, in syn. 1962. Verbena peruviana (L.) Britton x V. perakii (Covas & Schnack) Moldenke, Résumé Suppl. 4: 18, in syn. 1962.

Bibliography: Schnack & Covas, Darwiniana 7: 73. 1945; Moldenke, Résumé Suppl. 4: 10, 11, & 18. 1962; Moldenke, Phytologia 8: 378 (1962) and 10: 301. 1964.

This is the hybrid between V. perakii (Covas & Schnack) Moldenke and V. peruviana (L.) Britton, with intermediate characters, originally produced artificially by Schnack and Covas from cultivated material in Argentina in 1944. The two parent species grow together naturally in at least two provinces of Argentina, so the hybrid is likely to occur in the wild. It should have considerable horticultural merit.

VERBENA TENUISECTA Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 294--296. 1904.

Synonymy: Verbena dissecta Morong apud Briq., Ann. Conserv. & Jard. Bot. Genèv. 7-8: 294, in syn. 1904 [not V. dissecta Poepp., 1847, nor Schau., 1959, nor Spreng., 1959, nor Walp., 1849, nor Willd., 1825]. Glandularia tenuisecta (Briq.) Small, Man. Southeast. Fl. 1139 & 1508. 1933. Verbena tenera x lanceolata Kellogg ex Moldenke, Carnegie Inst. Wash. Publ. 522: 150, in syn. 1940. Grandularia tenuisecta (Briq.) Small ex Martínez Crovetto & Piccinini, Revist. Invest. Agric. 4: 77, 181, & 225, sphalm. 1951. Verbena ericoides L. ex Roig, Dicc. Bot. 2: 1114. 1953. Verbena arenicola Reade ex Moldenke, Résumé 357, in syn. 1959. Verbena bipinnatifolia Wall. ex Moldenke, Résumé 358, in syn. 1959. Verbena erinoides f. glabrescens Regnell ex Moldenke, Résumé 364, in syn. 1959. Verbena moteana Hort. ex Moldenke, Résumé Suppl. 7: 9, in syn. 1963. Verbena tenuiseta Briq. ex Moldenke, Résumé Suppl. 8: 6, in syn. 1964.

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Illustrations: C. Ludwig, Wien. Ill. Gart.-Zeit. 20: 442 [as *V. erinoides*]. 1895; Bull. Soc. Tosc. Ortic. 22: 77 [as *V. erinoides*]. 1897; Ed. Rodiges, Bull. Arboricult. Belg. 1902: 113 [as *V. erinoides*]. 1902; Sanzin, An. Soc. Cient. Arg. Buenos Aires 88: 130 [as V. erinoides]. 1919; Boynton, Addisonia 7: pl. 230 (in color) [as V. erinoides]. 1922; Hegi, Ill. Fl. Mittel-Eur. 5 (3): 2239 [as V. erinoides]. 1927; Junell, Symb. Bot. Upsal. 4: fig. 23 [as V. erinoides]. 1934; Moldenke in Gleason, New Britton & Br. Illustr. Fl., print. 1, 3: 136 (1952) and print. 2, 3: 136. 1958; T. H. Everett, New Illustr. Encycl. Gard. 13: pl. 13-11b (in color) [as V. laciniata]. 1960; Lewis & Oliver, Am. Journ. Bot. 48: 640, fig. 1. 1961; Irwin, Roadside Flow. Tex. pl. 39 (in color) [as V. pumila]. 1961; N. Y. Bot. Gard. Cult. Pl. 42722 color drawing. n.d.

Annual or perennial herb, varying from prostrate and creeping or semi-creeping to procumbent or decumbent, 10--60 cm. tall, sometimes of upright habit or suffrutescent at the base; stems usually decumbent, branched at the base, spreading and forming mats; branches mostly prostrate, ascending at the tips, divergent or bent, 20--55 cm. long, rooting at the nodes, tetragonal, sparsely pilose with antrorse hairs, becoming glabrescent in age; principal internodes 1.5--3 cm. long; vegetative parts aromatic-resinous; leaves decussate-opposite; leaf-blades triangular in outline, 2--3.5 cm. long, 2--3 cm. wide, green, tripartite-pinnatifid, substrigose above with appressed antrorse hairs, more densely so along the venation beneath, becoming glabrescent, the segments or laciniations all uniformly linear or narrowly linear, 1--3 mm. long, entire or dentate, mostly less than 1 mm. wide, obtuse (especially on the lower leaves) or sharply acute (especially on the upper leaves) at the apex, flat except for the revolute margins; inflorescence terminal, spicate, showy; spikes pedunculate, solitary, fastigiate, dense and short during anthesis, about 1.5 cm. long, ovate-capitate, later elongating to 4 or more cm.; flowers resinous-odorous, sessile, at first dense and ascending, later lax and spreading; bractlets subovate-lanceolate, 2--3 mm. long, usually about 1/4 as long as the calyx, canescent-puberulent on the back; calyx long-tubular, 8--9 mm. long, densely strigose or substrigose-canescent throughout, with a few scattered black glands, its tube about 7 mm. long, the teeth ovate, 1--2 mm. long, filiform-setulose at the apex; corolla hypocrateriform, showy, varying from blue, bluish, blue-violet, blue-lilac, deep-blue, bluish-purple, or purplish-blue to purple, light-purple, deep-purple, violet-purple, pink-purple, bright pink-purple, reddish-purple, magenta-purple, rose-purple, and brilliant rose-purple, or pink, rose, lilac, light rose-lilac, bright rose-lilac, dark-lilac, purple-lilac, vivid-rose, violet, light-violet, pale-violet, lavender, deep-lavender, magenta, mauve, or Parma violet-mauve, often purple with a minute white eye, drying blue, its tube glabrous, exserted 3--5 mm. from the mouth of the calyx, its limb about 10 mm. wide, the lobes broadly obcordate, spreading, 3--4 mm. long, 3--4 mm. wide above the middle, emarginate to 1--1.5 mm. at the apex, ciliate-pilose at the base within; stamens included; anther-connectives appendaged, the appendages glandular, scarcely exserted; style included, 1--1.3 cm. long, surpassing the calyx, lasting one day; schizocarp oblong-linear, yellowish, 3--3.5 mm.

long, prominently reticulate-nervose or -scrobiculate above the middle; chromosome number: 2n = 10.

The type of this handsome species was collected by Benedict Balansa (*no. 1025*) along roadsides at La Trinidad, Paraguay, on October 4, 1875, and is deposited in the herbarium of the Conservatoire et Jardin Botaniques at Geneva. The species is also published as though new in Chod. & Hassler, Bull. Herb. Boiss. 2 (4): 1059 (1904), where several specimens are cited, including *Hassler 6144* [photographed by Macbride in the Berlin herbarium as his type photograph no. 16451, the specimen now destroyed], which is sometimes referred to as a cotype. The Index Kewensis, however, maintains the Ann. Conserv. & Jard. Bot. Genèv. publication as the original one and there *Balansa 1025* only is cited; I therefore regard this collection as the actual type. The type of *V. tenera* x *lanceolata* was collected by John Henry Kellogg at the Missouri Botanical Garden in St. Louis, Missouri, on August 25, 1911, and is deposited in the United States National Herbarium at Washington; that of *V. erinoides* f. *glabrescens* is *Herb. Regnell s.n.* [Hort. Bergiano, 8/1897] deposited in the herbarium of the Naturhistoriska Riksmuseum at Stockholm; that of *V. arenicola* was collected by John Moore Reade in Muscogee County, Georgia, on April 3, 1930, and is deposited in the herbarium of the University of Georgia; and that of *V. moteana* is *Secondaire 6917* from Spain, deposited in the University of Lund.

Verbena tenuisecta resembles *V. tenera* Spreng., but the latter differs in having its bractlets about one-half (instead of only one-quarter) as long as the calyx, densely long-ciliate on the margins, and in having short and spreading often hirsutulous pubescence on the calyx-tube (instead of closely appressed-strigose). Further studies may show that Briquet's name may have to be supplanted by one of several older names for South American plants which may possibly prove to be conspecific with this taxon, as, for instance, *V. aristigera* S. Moore or *V. mendocina* R. A. Phil., both of which I am at present regarding as distinct taxa.

The species is native to and widely distributed in Brazil, Uruguay, Paraguay, Argentina, Bolivia, and Peru, and has been introduced into many other parts of the world. It was apparently introduced into cultivation in 1837 and is now widely cultivated in the United States. It has become naturalized there from North Carolina, Tennessee, and Arkansas south to Florida and west to Arizona and California, as well as in Quebec, forming a showy and welcome addition to the roadside flora. It is listed by Mohr (1901) as *V. tenera* Spreng. and by Perry (1933) and Cory (1937) as *V. erinoides* Lam. -- a name also widely used for it by horticulturists and gardeners. Cory cites it from the Rio Grande plains of Texas. It is one of the parents of the Teas Verbena (x*V. teasii* Moldenke) developed by Edward Teas at Houston, Texas, and now widely cultivated — the other parent being x*V. hybrida* Voss.

Verbena tenuisecta inhabits sandy or dry sandy soil, clayey soil, dry sunny soil, and sandy clay or sandy loam, and is found along roadsides, dry or sandy roadsides, highways, sidewalks, railroad rights-of-way, streets, waysides, and grassy roadsides in pine forests, as well as the margins of wooded streams. It has been collected at the edges of woods, in wet or ridge thickets, ditches and wet roadside ditches, sandy or waste places, open or grassy fields, dry fields and wastelands, pine forests and pine-oak woodlands, campos and low campos, sandy campos near rivers, gardens and waste ground, cultivated land and grassy places, shrubbery and open woodlands, pinelands and high rocky places, canyons, open grassy pastures of bayou margins, and in sand near the coast. Collectors have found it on river-bottoms and river flats, grassy road shoulders and highway shoulders, riverbanks and dry open sandy riverbanks, sandy clay banks and ditch banks, dunes, barrancas, steppes, and stream margins, rocky slopes and rocky hillsides, sandy roadsides, sandhills, and sandy rocky campos. It is found in dry places, sandy roadfill in stream bottoms, and gumbo glades (local prairie on tight marly substratum completely surrounded by pinewoods on sand). It has been found at altitudes of 16 to 2900 meters, blooming and fruiting in every month of the year.

In eastern Texas it is said to inhabit roadsides, fields, and waste places as an introduction, blooming from March to August, from Sabine to Orange and south to Victoria Counties. O'Neill says of it "rare along railroad tracks" in Florida, while McFarlin found it in waste places near an old phosphate bed in that state. Davis & Davis report that it "covers large areas of sandy roadside in Florida and Georgia". In the latter state Manning found it "surrounded by grass and sedge", Taylor found it "with woodsorrel, dogwood, and evening-primrose", Owens "in sandy soil among toadflax", and the Baileys say that it is "abundant" on roadsides. In Mississippi it is described by Lemaire as "common along highway", by Ray as "locally abundant along grassy roadside", by Cooley & Pease as "abundant", and by Demaree as "common in sandy areas near the coast". In South Carolina Bell found it in pine woodland with exposed granite and in sandy wooded crossroads cemetery, while Ahles & Bell call it a "weed along sidewalk". Ware encountered it in Louisiana in open post oak-blackjack oak-*Pinus echinata* woods on heavy reddish-brown clay soil with scattered prairie plants in open places, growing with *Schizachyrium scoparium*, *Tithymalopsis corollata*, *Pycnanthemum*, *Callirhoë*, *Petalostemon*, and *Asclepias*, and Ewan calls it "frequent" there. In North Carolina it is said by Wilbur to be "occasional along weedy border of fields". Mohr (1901) says that it is "fugitive on ballast [Mobile County, Alabama], flowers deep-blue, 1893--95; low creeping, the suffruticose stems 1 to 2 feet long." Wagenknecht reports it as a "common weed covering large areas along shoulders of roadsides in dry and sandy soils" in Florida.

Cory found it "frequent along streets" in Texas and notes "likely introduced by State Highway Department". In the same state it was found by Trew in "open upland area in sandy loam soil", while Traverse says "perennial herb 20--40 cm. tall, procumbent in snarled mass in grass, upright at ends, in much disturbed stream bottom, buff sand in *Pinus taeda-Quercus nigra* complex" and "on downtown streets, in cracks in concrete in sidewalk and edge of parking lot in brown very slightly clayey sand with *Sonchus*, *Gnaphalium*, and grasses". Spalding found it growing as a "waif along street" in California, and C. F. Smith says of it in that state "planted but weedy, apparently many colonies or plants are spontaneous". *Ekman H.12615* bears a notation on its label that the species is "cultivated and escaped" in the Dominican Republic. In Trinidad it is said by Broadway to be "cultivated largely as an ornamental object; of scandent habit; always flowering; blossoms either purplish or white." Garnier reports that in Nicaragua it is "cultivated in high elevations".

Montes states that the plant is "rare on high dry rocky campos" in Misiones, Argentina; Eyerdam, Beetle, & Grondona report it in "large clumps sometimes abundant over wide areas in semi-open fields, low sandy rolling hills, in shrub formation" in Buenos Aires; Lefebre found it "very common in fields" in the same province; while Jörgensen reports it "common on campo" at Villarica, "common" at Las Palmas, and "abundant" at Formosa in Paraguay. Martínez Crovetto & Piccinini (1950) say of it "Hemicriptófita radicante con flores lilacinas, frecuente en la región. Crece también en los palmares, pero en ellos es más bien rara" and cite their *no. 5527* from Corrientes, Argentina.

Baker avers that in Egypt it "likes damp places", while Meeuse says of it in the Transvaal "roadsides and spontaneous in gardens" and "wasteland in town, introduced, escaped, and spreading through Transvaal". *Singh 163* bears a notation that in India it is "also cultivated". In Queensland it was encountered by Jones "in yellow sand, loose surface, weeds on footpath and vacant allotment". Thorne (1954) describes the species as inhabiting "roadsides, pastures, waste places, and dry, open woods, abundant"; Sandeman found it in "full exposure and semi-shade"; Hatschbach found it "between *Iridaceae* and *Portulacaceae* in rocky land." L. H. Bailey's specimen from Glen St. Mary, Florida, is labeled "wild, said to be native".

The *H. J. Banker 3685* collection is a mixture with something geraniaceous or malvaceous. *D. S. Correll 15325* is a mixture with var. *alba*. Rambo says "in rupestribus parce humosis prostrata" and "pulcherrima species!" *Bailey & Bailey 1856* bears a notation by Dr. Bailey "probably not cultivated", but of *E. E. Barker s.n.* he says "a common and favorite garden flower [in Puerto Rico]; winged below anther".

Perry (1933) speaks of this plant as "*Verbena erinoides* Lam." and says "This species has established itself in several places. It belongs to a South American species-complex needing critical study to determine accurately its real identity". She cites no specimens. Most of the records of "*V. erinoides*" in botanical and horticultural literature, including those of Junell (1934), probably refer to V. tenuisecta rather than to V. laciniata where this name belongs. In most of my previous publications I regarded "V. crinoides Lam." as a synonym of V. tenuisecta, but it is obviously only a misspelling of V. erinoides Lam. and so must go wherever that name goes (viz., to V. laciniata).

Neal (1948) calls our plant V. pulchella and gives the names V. erinoides and V. tenera as synonyms, but, upon examination, her plants have all proved to be V. tenuisecta. I have personally observed the species in cultivation in Hawaii. Hieronymus says "Nach Grisebach von V. tenera Spreng. verschieden und zu V. erinoides als Varietät gehörigm scheint eigene gute Species." Eggleston 5104 in the Britton Herbarium has a slide mounted on the sheet.

Bailey (1935) says that seeds of what he calls "V. erinoides" are available from Breck, Buist, Burnett, Cherry Meadow Gardens [Framingham Center, Mass.], Dreer, Hunt, Hyde, Kew, Michell, Muller-Seely, Schling, Stumpp & Walter, Trivetts, Vilmorin, and Waterer. The seeds of N. Y. Bot. Gard. Cult. Pl. 22428 originated in Madrid. Seeds of L. H. Bailey s.n. [July 19, 1924] and s. n. [Aug. 10, 1924] were obtained by him from Vilmorin-Andrieux & Cie., Paris, as their no. 80067, were sown by him on April 18, and represent the variety "Violette"; those of his s.n. [July 23, 1925] and s.n. [Aug. 7, 1925] from Haage & Schmidt, Erfurt, as their no. 5199, were sown by him on April 7, the August 7 collection containing a seed packet on the sheet. Burdick 24 represents the variety "Rouen". Teas s.n. [Houston, June 1926] is labeled "the true V. erinoides", which it isn't! The H. H. Bartlett 19862, cited below from Uruguay, has "provincia Santiago del Estero" also on its label, so may actually come from that province of Argentina. L. H. Bailey 7737 and Burdick 24 bear this notation on their labels [appendage below anther" and H. H. Hume s.n. [June 1920] "wing below anther", in both cases signed by "LHB" [Liberty Hyde Bailey].

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BOOK REVIEWS

Alma L. Moldenke

"Quantitative Plant Ecology", by P. Greig-Smith, ed. 2, xii + 256 pp., illustr. Butterworths, Washington, D. C. 1964. $8.95

This new edition assesses the field of plant ecology with even more of the precise tools of the quantitative or statistical approach which is now assisting and/or overtaking the qualitative or descriptive approach. The main topics covered in this fine text are: quantitative description of vegetation, sampling and comparison, pattern, association between species, correlation of vegeta-